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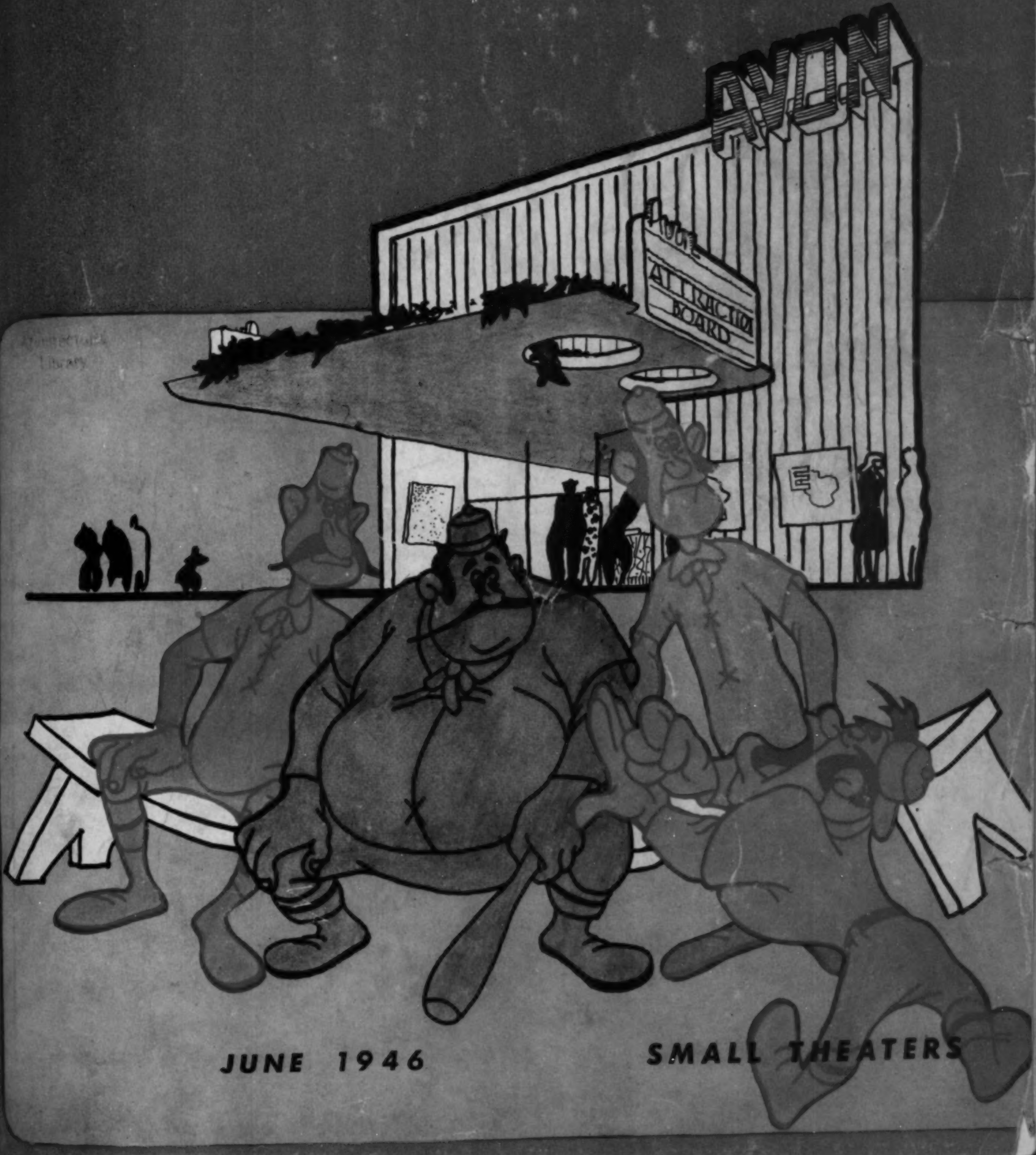
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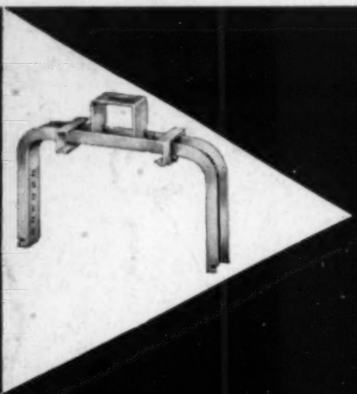

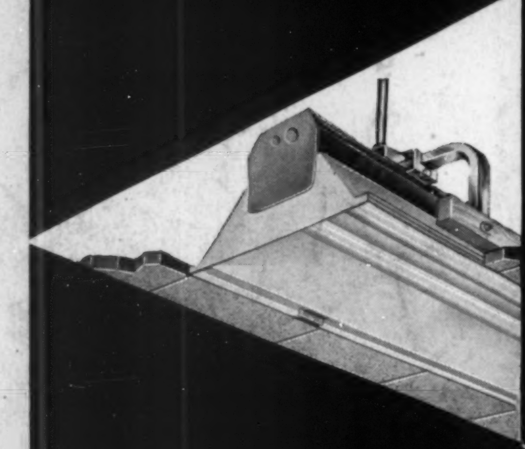

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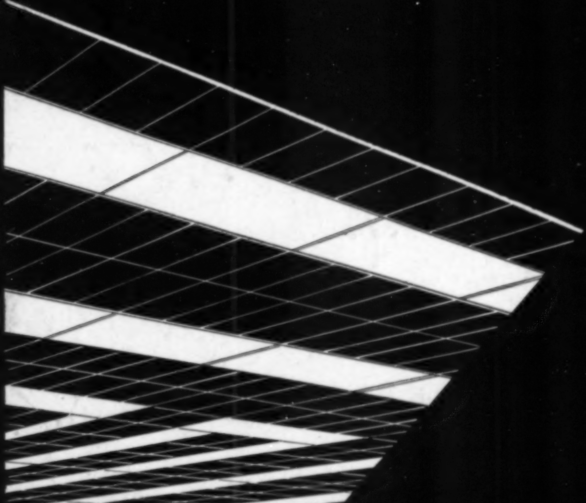

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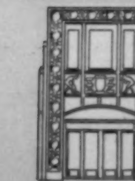

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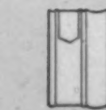

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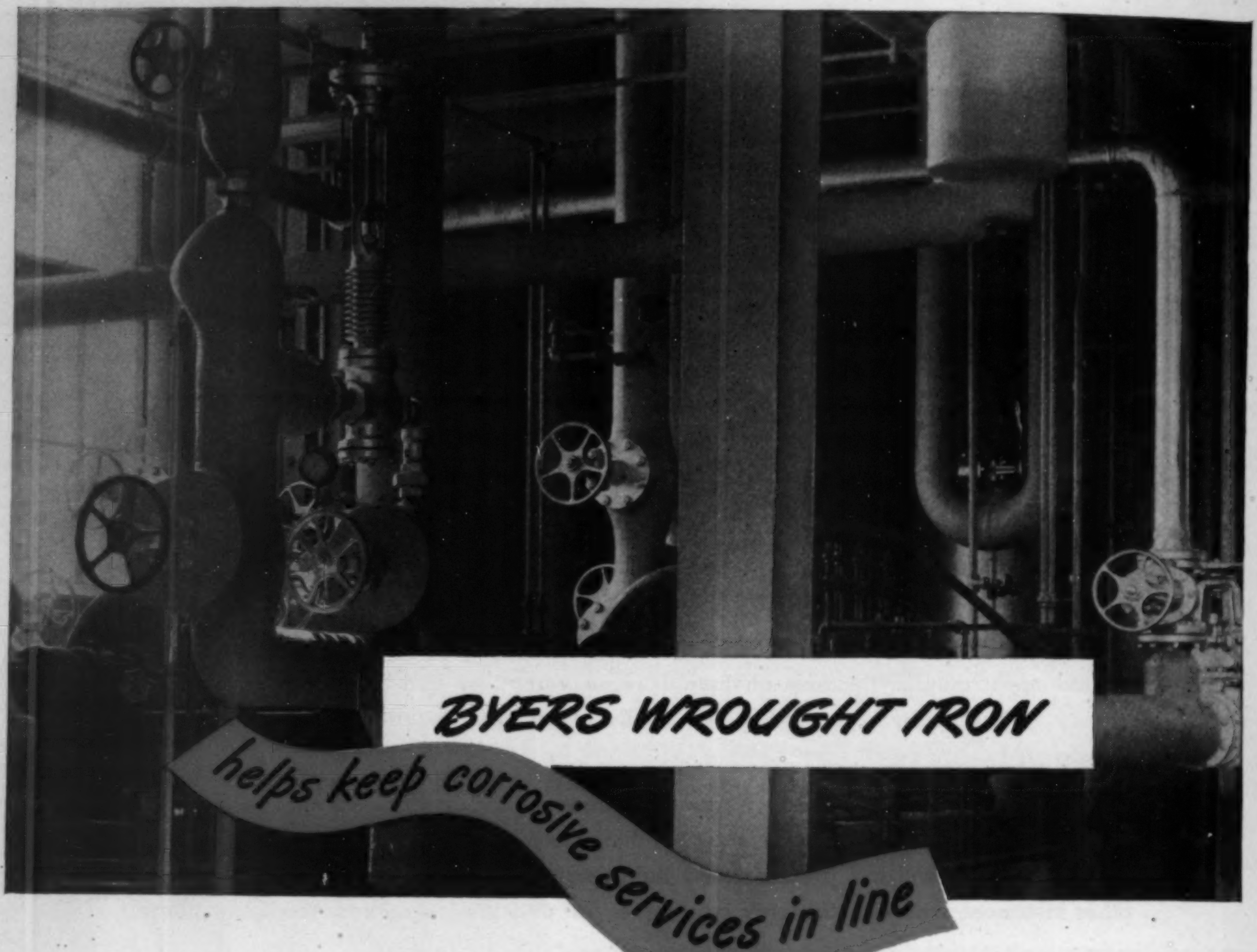

In almost all large buildings, the selection of piping for the boiler room is a phase of the planning job. The final specification plays a big part in determining the life and satisfaction of the installation, and so merits unusually careful attention.

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ARCHITECTURAL RECORD

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COVER: Cartoon figures from "Make Mine Music," courtesy of Walt Disney Studios

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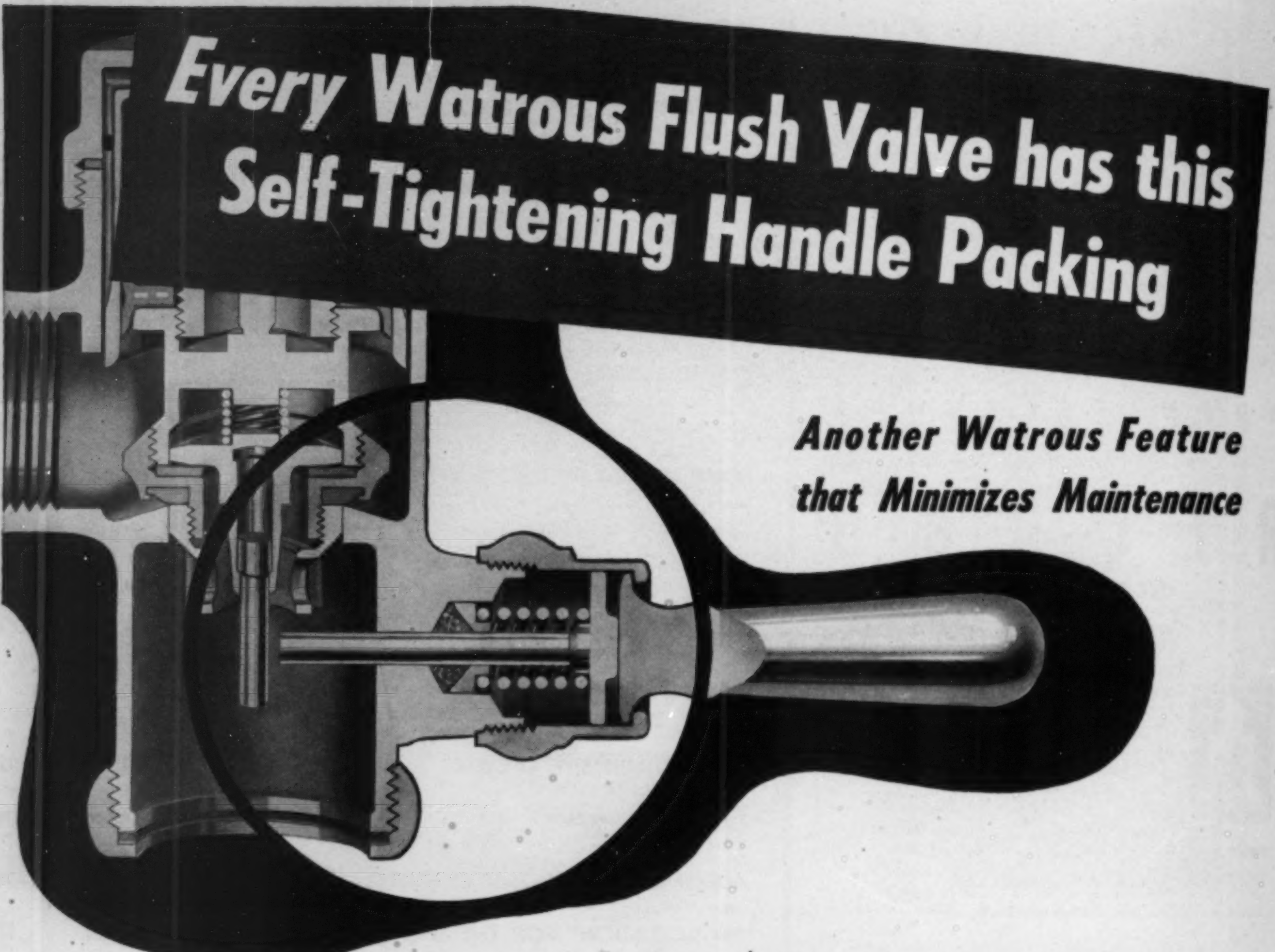

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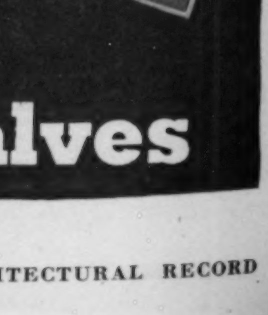


Watrous
Flush Valves

THE RECORD REPORTS

Lumber Situation Still Not Happy • Housing Program Is Under Way • Rental Housing Encouraged • VA Future Construction Destined for Private Architects and Engineers

As the rare days of June beamed on the nation's capital, officials professed to see the sun peep through — here and there — the dark clouds hanging over housing.

Nobody expects the clouds to clear away altogether, but optimism begins to show in some official faces. Analysts point notably to lumber. During April, May and June production is expected to total nearly eight billion feet or 30 per cent more than in the first three months of the year. Gradual alleviation of the tight lumber situation is anticipated by officials during the rest of the year.

Production Still Lagging

Only recently, however, Richard A. Colgan, Jr., executive vice president of the National Lumber Manufacturers Association, told the Senate Banking and Currency Committee that lumber production cannot possibly reach the government's goal unless OPA is ordered by Congress to change some of its methods of fixing prices, and charged that "inadequate price ceilings alone are responsible for most of our decreased production today."

"I cannot predict this year's total," Mr. Colgan said, "but it obviously will not approach the goal needed for the housing program — 36 billion board feet. That was our record production of recent years, reached in 1942. We *could* produce that much and more — the capacity is available. But the present rate is only at a little more than 24 billion feet, or *two-thirds* of what we need. It may rise somewhat, but under present conditions we cannot possibly attain the production goal set for us — and the housing program will inevitably fail by that much."

'47 Outlook Tight

It is pertinent here to note that in 1947 a lumber demand of about 42 billion board feet is expected as compared to an anticipated 1946 output of 32 billion board feet. How to replenish war-depleted stocks in the face of constantly growing requirements remains an unanswered problem.

Wild scrambles for lumber brought widespread black market charges, in the wake of which OPA and the Department of Justice set machinery to work for criminal prosecutions. Buyers and sellers are held equally responsible under the law.

As one means of boosting production, Representative Thom of Ohio introduced in Congress a bill, H. R. 5973, authorizing a yearly appropriation of $1 million for the Secretary of Agriculture to provide technical assistance to small- and medium-size lumber mills in increasing their output.

Housing Program Moves

The beginning of summer saw Wilson Wyatt's emergency housing program starting forward from coast to coast. Intended chiefly to aid veterans, it is expected, despite "stop" orders on much proposed construction, also to bring about increased necessary nonresidential activity. Wyatt himself warns against absolute reduction of construction competing with homes. As he puts it, people need other things besides housing.

Materials and manpower will be available to essential projects such as schools, hospitals, highways, streets, sewers and other utilities as well as industrial plants producing needed materials. In fact, the Housing Expediter says, there will be more, not less employment, building and investment in the heavy-construction nonresidential fields. Civilian Production Administration regional offices will screen out non-essentials (thousands of stop orders were issued before the end of April) and take care of applications for industrial and commercial construction.

CPA Takes Action

With a revised Priorities Regulation 33, CPA now lets FHA pass on housing construction of all kinds, including maintenance, repairs and alterations. It extends to the Department of Agriculture authority to pass on farm building applications other than dwellings. It adds items to the critical list on which priorities assistance is given, including asphalt and tarred roofing products, building board, gypsum board and lath and asbestos-cement siding shingles.

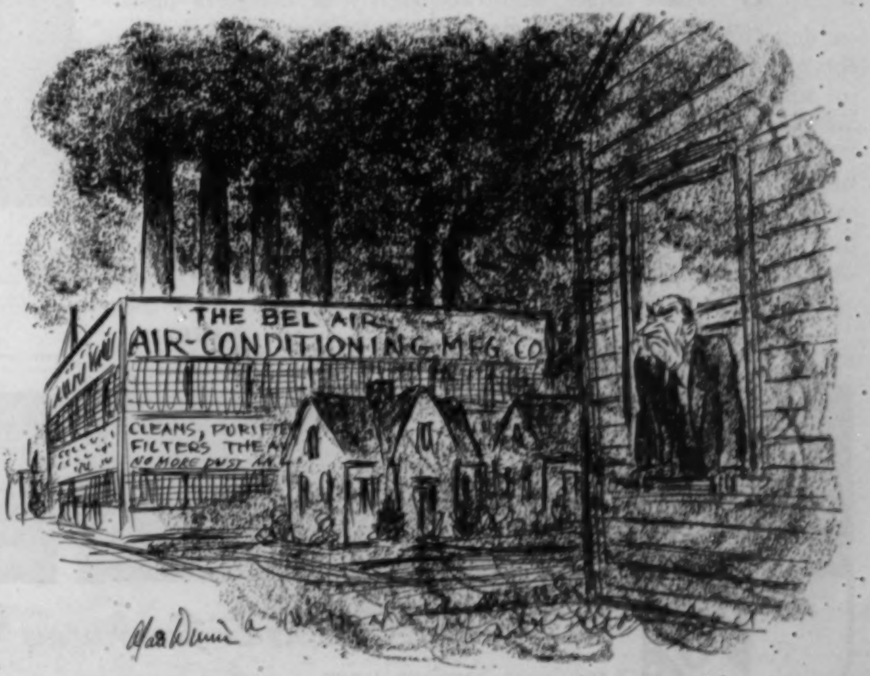
Washington is keeping in mind preference for veterans in allowing new store construction in the new housing developments. Where chain stores are given entry, it is assumed, they will hire veteran managers, clerks, salesmen, etc. Favor is expected for erection of stores in new communities rather than in sections already served.

Rental Housing Wanted

Wyatt advises that, with rental housing needs heavy, all possible encouragement is being given to apartment building projects, large and small. Expansion of Title VI of the National Housing Act, under the Patman Bill, he adds, would virtually insure private builders against loss in large rental housing units — 90 per cent loans on current costs rather than normal values.

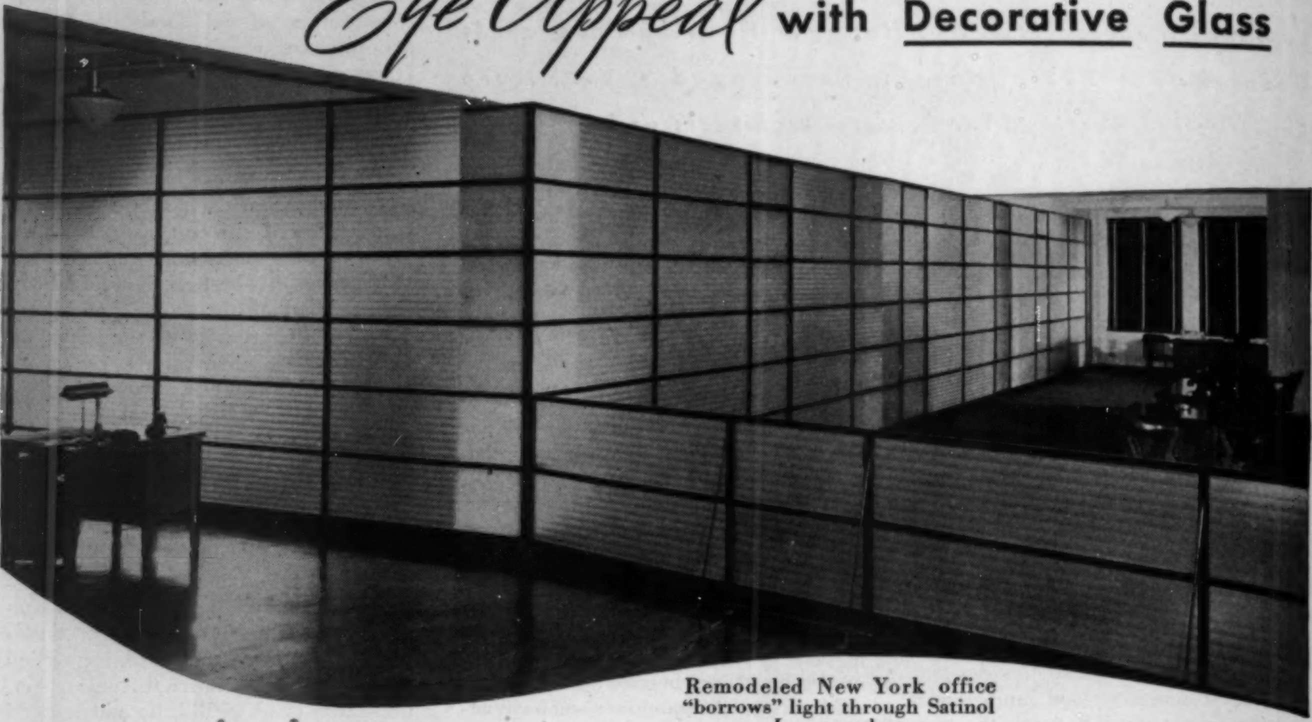
The swelling demand for building materials caused by the veterans housing program, estimates the Housing Chief, will reach a total nearing $15 billion. Besides lumber requirements, indicated earlier, he points out that demand for brick this year will run two-and-a-half times last year and three times as much

(Continued on page 10)



— Drawn for the RECORD by Alan Dunn

Eye Appeal with Decorative Glass



Remodeled New York office "borrows" light through Satinol *Louvrex* glass.

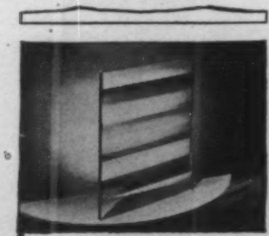
Whether remodeling a loft building or glazing an office hallway, Blue Ridge *Decorative Glass* achieves new, sparkling beauty—and "borrows" light for added brightness.

The floor-to-ceiling office partitions shown above utilize Satinol *Louvrex* glass, while the hallway partitions feature Satinol *Flutex*. Many other attractive patterns are manufactured by the Blue Ridge Glass Corporation of Kingsport, Tenn., and sold through leading glass distributors by Libbey·Owens·Ford. Architects, designers and contractors may specify plain or Satinol finish, semitransparency or complete obscurity. And these glasses may be *Securitized* (heat tempered) for greater resistance to thermal and physical shock. Most patterns are also available in modified bends. For further information, write the Blue Ridge Sales Division, Libbey·Owens·Ford Glass Company, 8966 Nicholas Building, Toledo 3, Ohio.

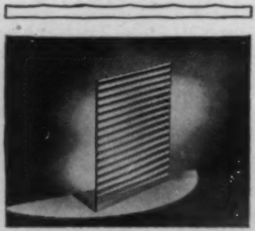
Smart hallway in a Chicago publishing office. Architect: James F. Eppenstein.

"Design it with one of the 5 EX's"

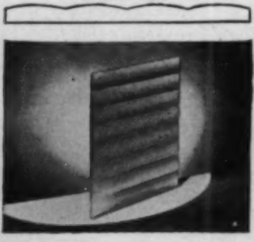
LOUVREX



LINEX



FLUTEX



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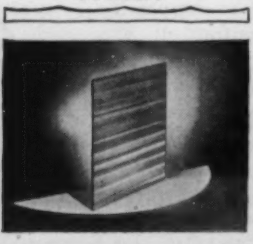

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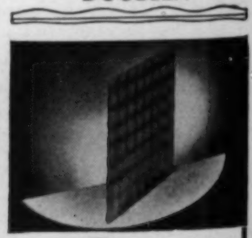

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CULVERTS
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PILING
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BUILDINGS

THE RECORD REPORTS

(Continued from page 7)

as in 1947. Clay sewer pipe and gypsum board and lath needs will run double 1945. For cast iron radiation, the 1946 need will be more than four times, and 1947 almost five times, 1945 production.

CPA figures show that the two groups representing most of the building materials — stone, clay and glass products and lumber products — plan capital outlays of over $800 million for the first year following the close of hostilities as against expenditures for such purposes of less than $100 million in 1939.

Non-Housing Authorized

More than $96,000,000 worth of nonhousing construction has been authorized since enactment of the Veterans Housing Program Order, the CPA reported late in April.

From March 26, when the order went into effect, to April 11, the field construction offices the CPA maintains in 71 cities had received 6,037 applications for construction authority out of which 1,431 applications with a value of $96,971,313.99 were approved and 167 applications with a valuation of $5,515,950.47 were denied. Of the total number received, 557 applications were withdrawn, 3,879 are still pending, and 40, with an individual valuation of more than $1 million each and a total valuation of $151,227,726, were sent to the Washington office for disposition.

More Prices Rise

OPA's Paul Porter continues upping price ceilings, with many products released from controls altogether. Stimulation of production, he cites as one reason for the actions. Among building materials the range varies. Lumber items recently allowed boosts are Northeast, Appalachian and Southern hardwood lumber, red cypress, Western pine, Douglas fir and hemlock.

Increases also affect white cedar shingles, Douglas fir doors and screen doors using wire meshes as well as glazed sash, window and garage doors. Other items upped include fireclay and silica refractory brick, warm air furnaces, water heater tanks, domestic fuel oil storage tanks, water storage tanks and solar tanks.

Atom Branches Out

Among major items on the legislative program prior to adjournment of the current session of Congress is the bill to set up controls over atomic energy. The plan is to establish a special commission with a subsidiary general advisory committee and military liaison committee, and to continue research.

Although ultimately far-reaching effects on the nation's economy are acceded, immediate ramifications of atomic energy are such that it will be long before building activity will be reshaped in any sense. However, the pending legislation makes provision for the Atomic Energy Commission not only to acquire materials and property but also to erect buildings and acquire and sell real estate. This includes requisitioning powers and powers of eminent domain. Presumably any such activity, at least for the present, will be for the housing, health, safety, welfare and recreation of personnel employed by the Commission. Ownership of production facilities is prohibited to private interests.

CD Funds Increased

Due to the incorporation in the Commerce Department of certain carry-over wartime activities, its annual appropriations by Congress show a sizable increase over last year. Included, presumably in blanket fashion and without specific mention, are certain activities of the new Construction Division, which absorbed statistical work of the old War Production Board.

High Court Backs N.Y.C.

Of interest is the recent decision of the Supreme Court upholding an amendment to New York's Multiple Dwelling Law. This 1944 amendment required that lodging houses "of non-fireproof construction existing prior to the enactment of this subdivision" comply with certain new requirements, including the installation of an automatic wet-pipe sprinkler system. The Queenside Hills Realty Co. instituted suit for a declaratory judgment holding these provisions unconstitutional, but the high tribunal upheld the city.

Save that Neighborhood!

In a discussion of "neighborhood conservation" as part of its series on urban planning, the Federal Home Loan Bank points out that cities lose to the suburban fringe new construction that goes there because of the shabbiness of the older city neighborhoods.

While the present dearth of building lots, it says, will probably put some new construction in these neighborhoods, more might be attracted if steps were being taken to keep them sound and attractive.

It calls attention to the need for a thorough study of the costs and methods

(*Continued on page 12*)

DODGE SURVEY UNCOVERS CONSTRUCTION BOTTLENECKS

The construction industry's goal of full production has been stymied by inadequate price ceilings, strikes directly and indirectly affecting production in plants and factories, inadequate manpower, inefficient manpower, inadequate raw materials, and inadequate supplies other than raw materials. This is the conclusion reached by F. W. Dodge Corp. following a survey conducted among top executives of the nation's leading building materials and equipment producers.

Government regulations, particularly administration of the Price Control Act, are cited as the chief bottleneck of production by producers of such materials and equipment as masonry products, wood, metal products, glass, roofing and siding, heat insulation, wallboard, floor and wall materials, paints and finishes, doors, windows, hardware, sanitary equipment, water supply and drainage, electrical distribution, air conditioning and heating.

Some producers have already discontinued nonprofitable lines, among them roofing, siding, heat insulation materials and hardwood. The Wyatt program restricting nonresidential construction has been of deep concern to many manufacturers, particularly in the heating and hardware fields and among manufacturers of building stone and cement.

Paint manufacturers, the only important group not faced with the problems of strikes, inadequate or inefficient manpower, are being hit hard by price controls, inadequate supplies of flaxseed, linseed, drying oils and pigments, metal containers and even paper for printing labels.

Strikes in their own plants or in the plants of their suppliers have affected production in masonry materials, metal products, glass, roofing and siding, waterproofing, doors, windows, hardware, sanitary equipment, water supply and drainage, air conditioning, heating and lighting equipment. Inadequate manpower was reported as a bottleneck in all the lines above, with the exception of metal products, waterproofing, and lighting. Inefficient manpower was reported as a problem among producers of masonry materials, metal products, glass, roofing and siding, heat insulation, wallboard, floor and wall materials, hardware, air conditioning and heating.

Inadequate raw materials were reported as a problem among producers of wood products, metal products, roofing and siding, wallboard, paints and varnishes, doors, windows, hardware, sanitary equipment, water supply and drainage, air conditioning, heating and lighting. Inadequate supplies other than raw materials are affecting production of wood products, paints and varnishes, hardware, water supply and drainage, air conditioning, heating and lighting.

Charm and Beauty

For low-cost concrete homes

Could be, that available concrete and lightweight aggregate block will play a big part in small home construction. And certainly this type of construction finished with Medusa Portland Cement Paint makes a charming small home.

Medusa Paint has Portland Cement as a base—the same material used in the block itself. That's why it bonds perfectly, making a permanent decorative and weatherproofed cement-like finish. Medusa Paint's low first-cost and easy application—helps you keep the total price within the budget. It mixes with water—is sprayed or brushed on damp or dry, inside or outside on concrete, stucco, or masonry surfaces. Your choice of eight distinctive colors, black and white. Here's paint that saves time because it can be used on new damp construction and can be applied on damp days.

For all the facts on Medusa Portland Cement Paint, write today for the descriptive illustrated book "How to Paint Concrete, Stucco, and Masonry" —26 years of experience are packed into this volume.

"OVER 53 YEARS OF CONCRETE PROGRESS"

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CONCRETE
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MASONRY

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Gentlemen: Please send me a copy of the book, "How to Paint Concrete, Stucco and Masonry."

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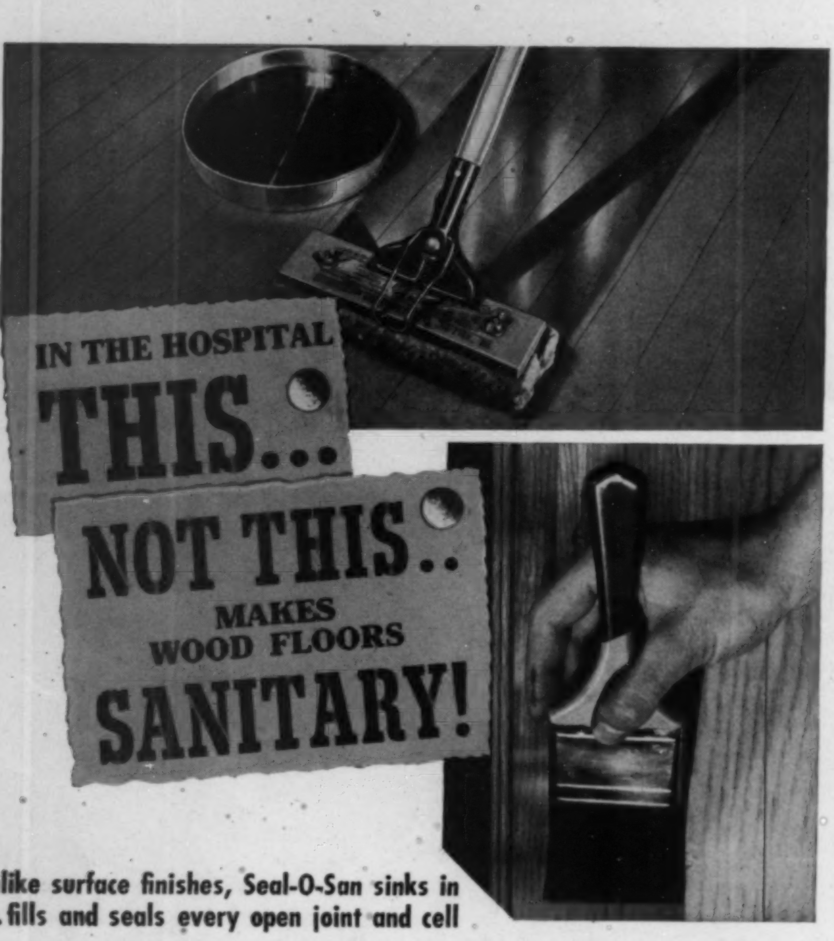


Unlike surface finishes, Seal-O-San sinks in ...fills and seals every open joint and cell

THE architect who specifies Penetrating Seal-O-San for hospital floors wins the gratitude of everyone charged with efficient hospital management. For Seal-O-San not only keeps the surface clean, it makes certain that every wood cell *below the surface* remains clean.

A Seal-O-San finish becomes part of the wood. Penetrating deep, the liquid fills the empty cells, eliminating the *hidden* sources of dirt. Sealing the cells, it forms a protective finish that actually reinforces surface fibres. Thus, a Seal-O-San finished floor is covered with a *wear-resisting* seal that locks out dirt or moisture. As a result, stains and dust are *easily* removed. Costly scrubbing is seldom necessary.

Moreover, the tougher Seal-O-San finish keeps dirt from piercing the surface and getting a foothold. It puts an end to cracks and crevices that harbor germs or dirt. That's why a Seal-O-San floor *stays clean* longer... why maintenance becomes simple and inexpensive.

Unlike hard, brittle, surface finishes, Seal-O-San will not chip, crack, or peel. Consequently, Seal-O-San has convinced hundreds of hospital administrators that it will not break down where traffic is heaviest.

Seal-O-San leaves a beautiful, soft-lustre, natural finish—as smooth and polished as a fine piece of furniture. And the ease of application—with a lambswool mop—brings worthwhile labor savings.

Your insistence on *beauty, cleanliness* and *simple maintenance* for hospital floors will inevitably lead you to Seal-O-San. Why not write for specifications and details—*today!*

HUNTINGTON LABORATORIES INC
DENVER HUNTINGTON, INDIANA TORONTO

P-E-N-E-T-R-A-T-I-N-G
SEAL-O-SAN
PERFECT SEAL AND FINISH FOR WOOD FLOORS

THE RECORD REPORTS

(*Continued from page 10*)

of house maintenance and repair and for new methods of financing repairs and improvements.

Home Costs Surveyed

NHA reports the results of a late March survey on price increases for homes and building lots from spring, 1940, to February, 1946 as follows:

Lower-priced homes up 65 per cent; medium-priced, 57 per cent; lots, 61.8 per cent. Regionally, home prices rose most in the Pacific area, least in the Middle Atlantic area.

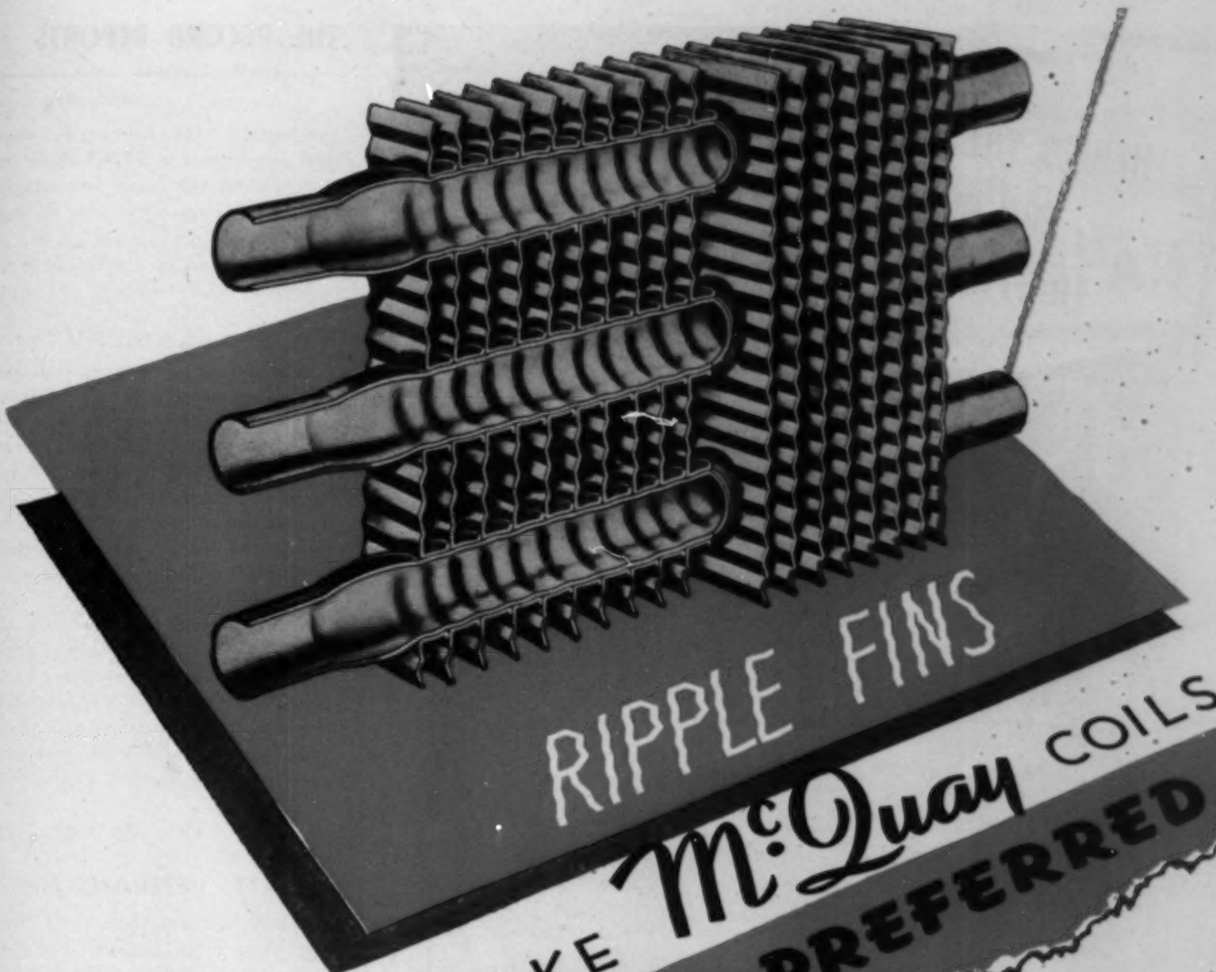
Last September to February this year: up 17.7 per cent, 14.8 per cent, 23.3 per cent respectively; "H-2" houses over WPB ceilings (lifted last fall), 30.5 per cent.

Federal Steps Vary

Recent federal developments touch a wide variety of topics of immediate interest to architects, building contractors and others in the construction industry. Here is summary mention of a few:

1. CPA hopes increased output of building materials will permit relaxation, if not complete lifting, of its Veterans Housing Program Order 1 by next January.
2. The Census Bureau is making a check of building codes and will publish its compilations.
3. Housing experts are seeking now to correct only the "worst" faults in local building codes; analysis of about 600 codes is under way. Efforts at correction will be made through local chambers of commerce, and specific trade and realty groups.
4. In many parts of the country, Labor Department officials say, increased availability of materials would not help much since contractors could not get sufficient workers.
5. NHA wants to stimulate expansion of local utilities and traction companies into the suburbs to service new housing developments.
6. The Stabilization Director is pressing to check sharp increases in commercial rents, particularly in the interests of new ventures, with emphasis on veterans' projects.
7. The Reconversion Office has under way a survey of guaranteed annual wage plans and includes construction among the industries to be studied. When completed, the plan is to circulate the findings among employers and trade unions rather than to seek legislation.
8. Rear Admiral Kirby Smith as General Deputy Expediter for the veterans' emergency housing program is putting first emphasis on problems of supply and

(*Continued on page 14*)



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PROVED and PREFERRED

McQuay coils, because of their ripple fins, are proved and preferred—proved by service under the most rigid conditions and preferred because of their exclusive construction.

Ripple fin coils naturally have greater heat transfer surface. They also have higher flexible strength with less air friction and cleaner operation. Hydraulic expansion of tubes into wide collared fins, another exclusive McQuay feature, provides a permanent mechanical bond with greater contact surface between fins and tubes. Copper headers are used in all McQuay coils, because inherent flexibility of copper enables it to meet the unequal contraction and expansion. This results in the strongest possible construction.

McQuay coils are available in a wide variety of styles and sizes, both standard and special coils for steam, hot water, cold water, brine, direct expansion and other applications.

For complete information write McQuay, Inc., 1605 Broadway Street N. E., Minneapolis 13, Minnesota. Representatives in all principal cities.

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AIR CONDITIONING EQUIPMENT
ESPECIALLY DESIGNED
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HERE'S THE ANSWER
FOR HEAVY
TRAFFIC FLOORS
1
GRIP WITHOUT A SLIP!
2
EASY TO CLEAN!
3
EASY TO MATCH!

So you can Count on these 3

To the inherent characteristics of steel floor plate (such as durability, ability to stand tough traffic, oil, heat, fire and crackproof and no maintenance cost) add, for A. W. Super-Diamond these three distinctive advantages well worth knowing about for safer floors. Notice the shape of the elevations and the pattern? 30% minimum contact area with the shoe. Sloping sides that maintain "sharpness" of contact, resist dirt collection, make for easier cleaning, better draining. And a pattern that matches more easily with less scrap! These are reasons why alert architects, builders, product engineers, and purchasing agents are insisting on AW Super-Diamond Floor Plates.

Write For 16 page Booklet L-33 Giving Helpful Information on Weight Per Square Foot and Maximum Sizes. Alan Wood Steel Company, Conshohocken, Pa.

AW SUPER-DIAMOND

FLOOR PLATES THAT GRIP

A Product of ALAN WOOD STEEL COMPANY

THE RECORD REPORTS

(*Continued from page 12*)

production. He previously developed and supervised a $4.5 billion building program for the Navy Department.

9. No matter what may be done taxwise in the last minute by the present Congress, signs on Capitol Hill point to a general tax revision in 1947.

VA Changes Policy

The A.I.A. has announced that with the exception of some few jobs already long since on the boards, the entire construction program of the Veterans Administration will be given out to architects and engineers in private practice. The program will be in progress for a number of years and will include several hundred million dollars worth of construction.

With the collaboration of the A.I.A., the VA has set up a board of consultant architects. These consultant architects are assisting the Administration to develop the various criteria and standards for the guidance of those architects and engineers engaged in the program.

◆ ◆ ◆

WYATT, VETERANS MEET

Early last month national officers of the American Legion, the American Veterans Committee, the Veterans of Foreign Wars and the American Veterans of World War II met with Housing Expediter Wilson W. Wyatt in the first session of NHA's new Veterans Advisory Council. Officers of the Disabled American Veterans, also invited, could not attend. The Council will meet regularly with Mr. Wyatt for the dual purpose of keeping him informed of veterans' views, criticisms and suggestions and keeping the veterans up to date on the problems and progress of the emergency housing program.

Several interesting proposals came out of the first session:

1. Stimulation of the building trades apprenticeship programs by calling for Joint Management-Labor Apprenticeship Committees where they do not already exist and by interesting the veterans in the long-term advantages of learning construction crafts.

2. Permission to build homes "slightly" over the $10,000 ceiling for veterans with very large families where sufficient space cannot be obtained otherwise in areas of especially high construction costs.

3. Permission for home owners, in cases where a state might have to exercise eminent domain and remove houses in the way of essential highways or other public construction, to move and rehabilitate their homes, even though such home owners be non-veterans.

(*Continued on page 140*)

For huge multitier bookstacks or shelving for small libraries

Call on SNEAD & COMPANY

Skeleton steel bookstack structure, Yale University Library

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Columbia U.
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Maria Mitchell Library, Nantucket, Mass., built completely by Snead & Company, including book ranges and other equipment.

For many generations Snead & Company has been the leader and pioneer in the design and construction of library equipment. Whether you are planning a large multitier bookstack or a library of modest size, it will pay you to contact us for a free consultation.

We will gladly assist in the preparation of plans and specifications, and submit a quotation. Since proper planning takes time, we suggest that you let us start without delay.

Write for the Snead bookstack catalog containing engineering and library planning data.

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PREFABRICATORS ANNOUNCE PLANS

Shelter Industries' two-bedroom house

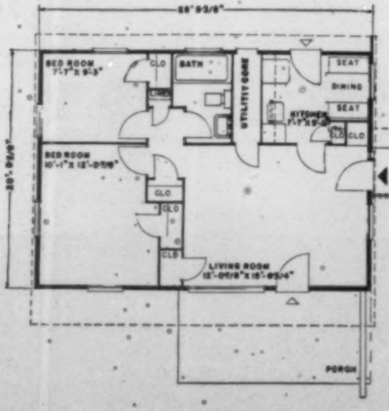
PREFABS FOR VETERANS

Falling in with Housing Expediter Wyatt's emergency housing program, a number of prefabricators have announced mass production plans of small, quickly erected, low-cost units. Among them:

Shelter Industries

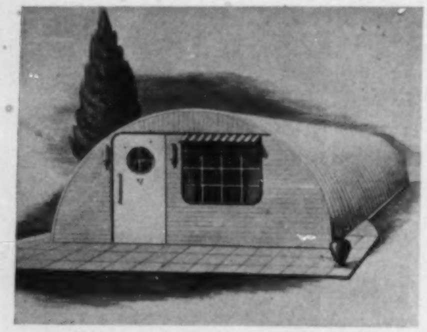
Already being manufactured for sale to veterans at a factory price of $4,685, with first deliveries anticipated by the end of this month, is Shelter Industries Inc.'s two-bedroom house. Of permanent construction designed to meet all FHA space and structural requirements, this house is a basic unit consisting of living room, two bedrooms, bath and dinette-kitchen; it is easily expandable by the addition of a third bedroom and a dining alcove.

Floor, exterior and interior walls and roof are all factory-fabricated, stressed-skin plywood panels, insulated with a two-ply aluminum foil insulation providing three separate air spaces between the panels. Equipment includes a choice of gas or oil circulating warm air furnace, gas or electric hot water heater, all plumbing, tub-shower bath combination with all other bathroom fixtures, and complete kitchen equipment including sink, cabinets, electric refrigerator and gas or electric range. All of these are designed and built into the house in one compact central core — Borg-Warner Corp.'s Ingersoll Utility Unit (see AR, April, '46, p. 162).



Floorplan of the Shelter Industries house

Design of the house is based on eight years of study and research by the staff of Donald Deskey Associates. Ralph Gulley, director of Shelter Industries, was chief architect. Features are a 3-ft. overhanging eave on the terrace side of the house, equipped with pipe fittings for the addition of an awning; a large picture window in the living room, overlooking the terrace; cross ventilation in every room; five good-sized clothes closets, a linen closet, a kitchen-storage-utility closet and 27 sq. ft. of kitchen shelf space. Over-all size of the house is 28 ft. 8 in. by 20 ft. 8 in.



The Blaski house features air-flow curves

Blaski Aluminum

The Streamlined Aluminum Home recently introduced by the Blaski Mfg. Co. was created especially for returning veterans. Mass Production is already under way.

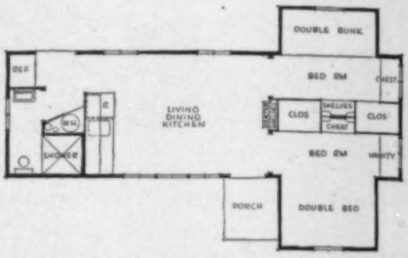
Done in the natural finish of aluminum, and precision fabricated in airflow curves, the Blaski house is Quonset-shaped, 16 ft. 6 in. by 22 ft. 3 ¾ in. in size. The combination living-bedroom is 15 ft. 11 in. by 12 ft. 10 in.; the kitchen accommodates a full-sized electric refrigerator, a four-burner gas stove, a sink and electric washer, a combination work and dining table, and two chairs.

The 24 S.T. Alclad Aluminum, Blaski reports, will last a lifetime without any painting or other maintenance whatever. Its high reflectivity insulates out the heat of the summer sun, and helps to keep in the heat from the gas or electric heater in the winter.

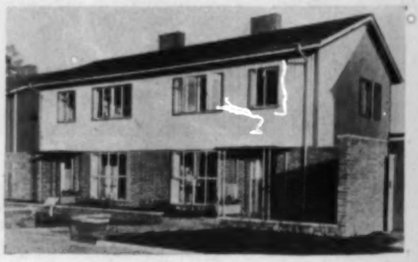
Wingfoot Homes

Mass production of 48,900 two-bedroom homes annually, if necessary materials and equipment are readily forthcoming, has been promised by P. W. Litchfield, chairman of the board of the Goodyear Tire and Rubber Co. Using idle war plants, the completely assembled homes will be built at the rate of 157 per day by Wingfoot Homes, Inc., a Goodyear subsidiary. They would sell at the factory for under $2,500, would be delivered complete with bathroom and kitchen fixtures, built-in beds, bureaus, closets, mirrors and cabinets.

Wingfoot's two-bedroom prefab has telescopic wings to permit delivery by truck



First developed in 1942, the Wingfoot Homes have been produced on a limited scale during the past year in a pilot assembly plant at Litchfield Park, Ariz. The house is 26 ft. long and 8 ft. wide, which permits easy delivery by truck. At the site, telescoped wings are pushed out to convert the structure into a T-shaped unit 26 by 15 ft. in size. A front porch and a roof are attached as the house is moved onto its foundation ready for sewage, water, gas and electric connections.



B.I.S.F. model, designed for urban areas

British Prefabs

Large-scale production is under way in England of two new types of prefab: the B.I.S.F., of steel construction, designed by the British Iron and Steel Federation, and suitable for urban areas in groups of 50 or more; and the Airey, of precast concrete construction, suitable for rural areas.

OTHER BUILDING NOTES

New Offices

An entire facade of aluminum, with the exception of the window areas, will be the feature of a 20-story office build-

(*Continued on page 18*)

BUILD WITH

STRAN STEEL

A Simplified Framework of Uniform Quality . . .

Cut to accurate lengths and supplied with all structural and joining members necessary for each building or development, Stran-Steel framing simplifies construction and provides greater permanence for homes.

Studs, joists and channel plates are easy to handle, and make possible speedy construction. A patented nailing groove in framing members permits nailing wall or other collateral materials directly to the steel framework. Stran-Steel accessories to connect framing members are supplied in correct quantities, and make construction easy and practical with ordinary hand tools.

For simplicity and reliability—for the strength and uniformity of steel, made practical for varied framing requirements—build with Stran-Steel. For further details, see Sweet's File, Architectural, Sweet's File for Builders, or the January issue of Building Supply News.

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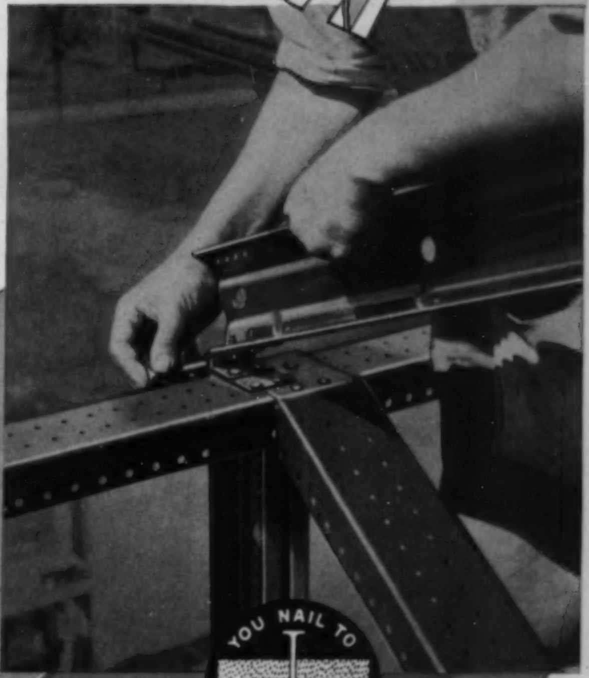
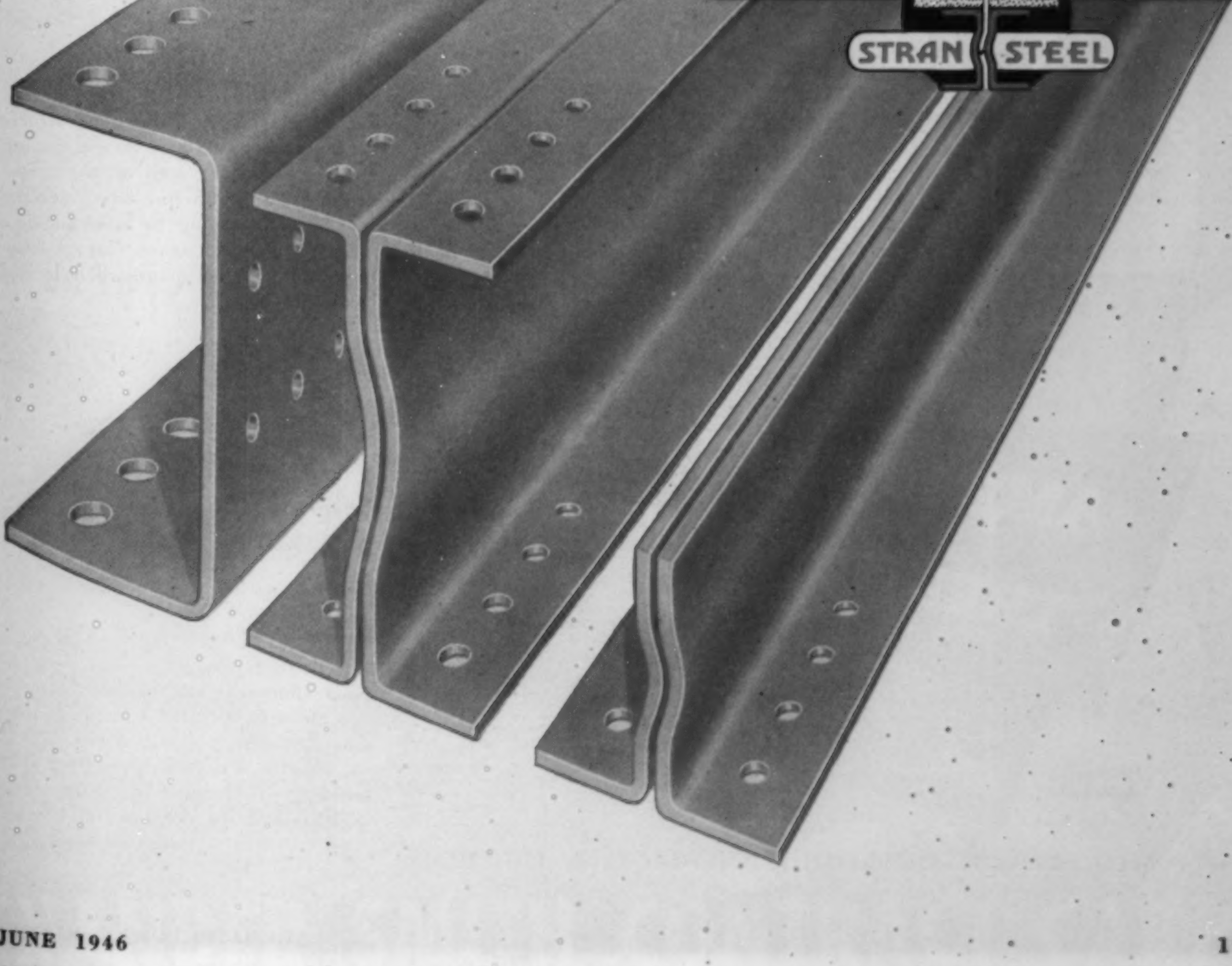


YOU NAIL TO STRAN STEEL



When conditions are

STEAM SWEAT or SOAK

USE WOLMANIZED LUMBER*

Why? Because this lumber, impregnated with Wolman Salts* preservative by pressure treatment, will give you more years of service in places where rot-producing moisture is present.

It is recommended for use in structures exposed to:

1 Moisture in artificially humidified buildings.
2 Steam and vapor from industrial processes.
3 Condensed water vapor in walls, floors and ceilings of refrigerated buildings.
4 Soil moisture and rainwater, held in joints, etc., of outdoor structures.
5 Moisture condensed by concrete or masonry.

When you buy treated lumber, remember to specify *pressure-treated* . . . it's the only dependable kind!

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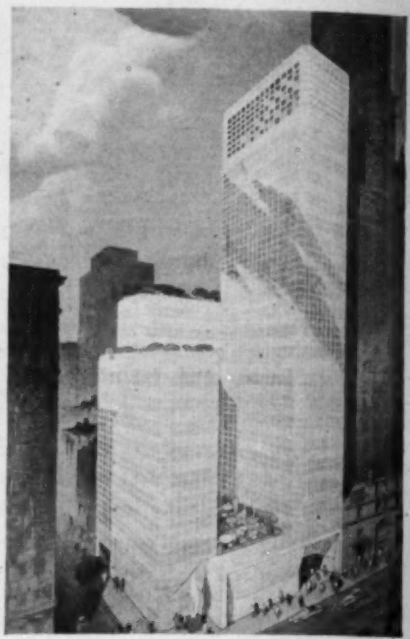
BUILDING NOTES

(*Continued from page 16*)

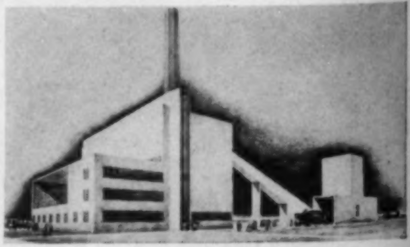


Proposed aluminum-faced office building

ing to be erected by the Aluminum Company of America at Park Avenue and 58th Street, New York.

Employing a new type of construction embodying an aluminum-faced curtain wall, the proposed structure has been designed as a "dramatic demonstration of all the proven architectural applications of aluminum." Harrison, Abramovitz and Wiggins are the architects.

Designed to have something of an irregular U-shape, the building will permit maximum utilization of office space exposed to daylight. There will be a large display area on the ground floor with an aluminum-faced escalator at the rear leading to a second-floor lounge and open terrace. Garage facilities for building occupants will be located in the basement.

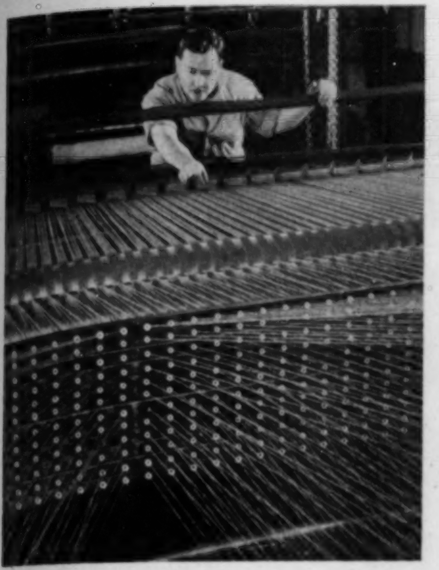


Power house for Sherwin-Williams plant

Power Plant

Construction is under way on a new power house at the Chicago plant of the Sherwin-Williams Company, paint manufacturers. Approximately 125 ft. sq., equal to seven stories in height, the building will have a tile exterior, red colored floors of concrete on the first

(*Continued on page 138*)



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Our looms are weaving contract carpet at top speed . . . weaving it by the mile in stunning new colors and eye-catching designs. But even **MILES** of carpet isn't enough to fill the demand. So continue to be patient, please. It shouldn't be **TOO LONG** before you can again specify "Alexander Smith" and have your order filled without delay. Alexander Smith & Sons Carpet Company, 295 Fifth Avenue, New York 16, N. Y.

Weavers of **"Crestwood"**. . . America's No. 1 contract carpet

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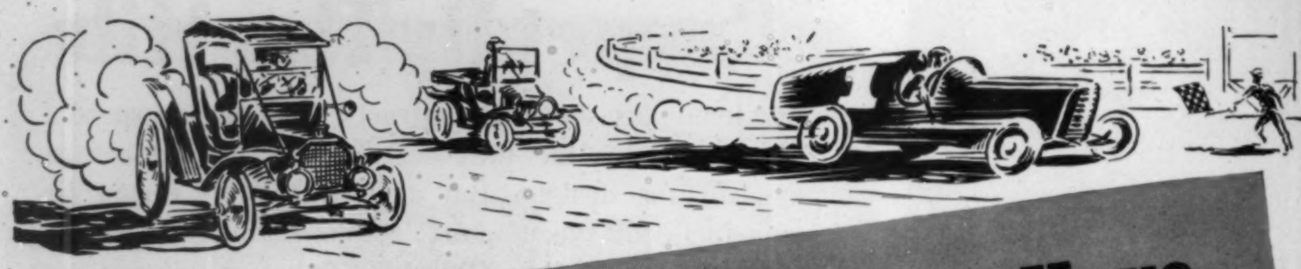

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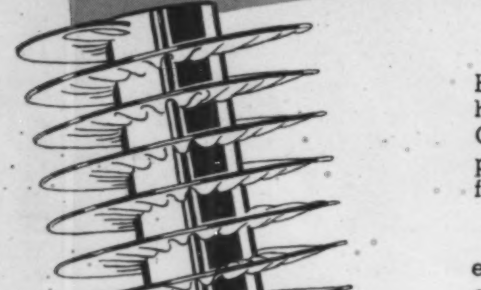
Aerofin's Dependable Engineering is Your GUARANTEE



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Each tube built to expand and contract independently, thus relieving headers, tubes and tube joints of strains due to temperature changes. Crowned orifice insures equal steam distribution to each tube and prevents freezing due to clogging of tubes by scale and other foreign matter.

NON-FREEZE AEROFIN COIL

embodies all of the features of Aerofin Flexitube, plus non-stratifying and non-freeze features for any entering air conditions.

UNIVERSAL AND HIGH PRESSURE AEROFIN

for steam heating where a heavy coil of rugged construction is required.

CONTINUOUS TUBE WATER COIL

for cooling or heating with water, brine or other non-volatile refrigerants.

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for same duties as Continuous Tube Coil, with added feature of removable header for complete cleaning and draining of each tube.

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for cooling with volatile refrigerant. Patented distributing headers insure perfect distribution for all loads.

SPECIAL COILS FOR SPECIAL APPLICATIONS

For long, trouble-free, low-cost service select the *right* type, design, size and material. Aerofin units are insurance against costly changes and repairs:

- Metallic bond of fin and tube is not injured by expansion or contraction.
- Rigid material specifications and inspections assure quality that maintains Aerofin's dependable ratings.
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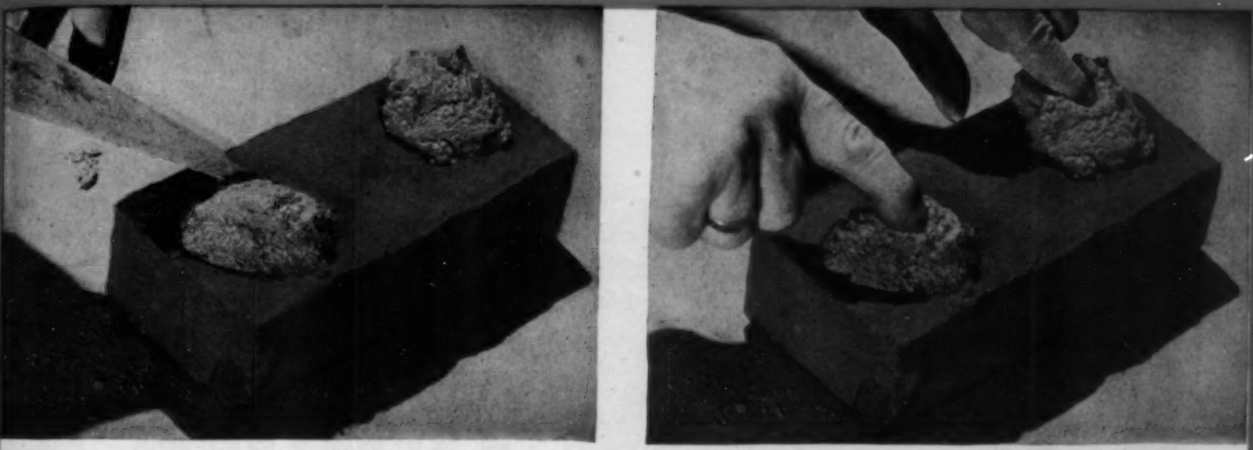
Has Better Water-Retention



Here's the way to test for high water-retention. Slap a small dab of any two mortars onto a brick. Wait a minute, then feel each dab. The one that stays plastic longest will be the one *having the* highest water-retention. *Try this with Brixment mortar!*

—AND HIGH WATER-RETENTION IS ESSENTIAL TO WELL-BONDED, WATERTIGHT MASONRY

Water-retaining capacity is the ability of a mortar to retain its moisture, and hence its plasticity, when spread out on porous brick. ● High water-retaining capacity is of *extreme importance* in mortar. If the mortar does not have high water-retaining capacity, it is too quickly sucked dry by the brick; the mortar stiffens too soon, the brick cannot be properly bedded, and a good bond cannot be obtained.

Brixment mortar has extremely high water-retaining capacity. It strongly resists the sucking action of the brick. Brixment mortar therefore stays smooth and plastic longer, when spread out on the wall. *This permits a more thorough bedding of the brick, and a more complete contact between the brick and the mortar.* The result is a better bond, and hence a stronger and more *water-tight wall.*

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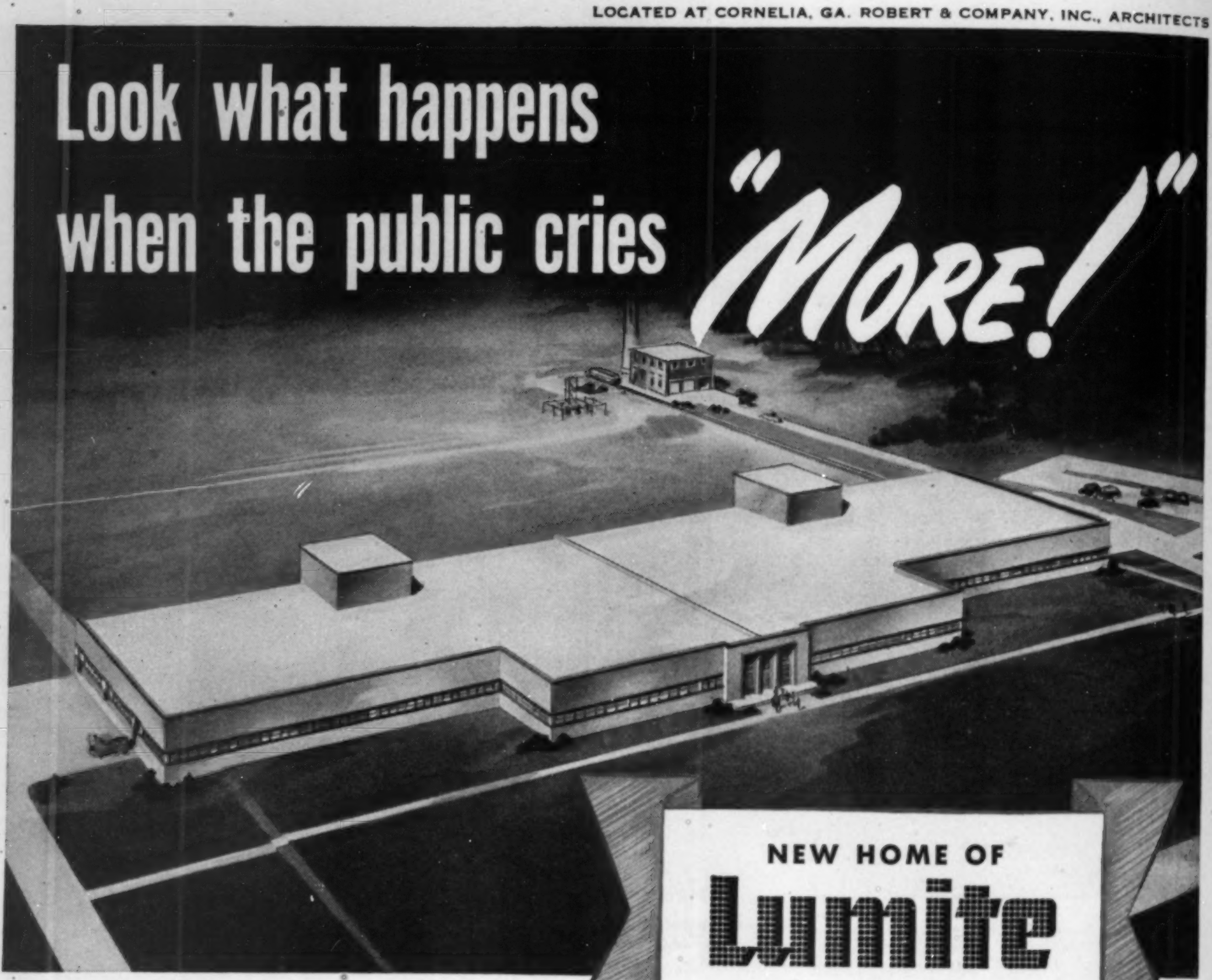

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This amazing plastic screen that can't rust, corrode or stain... that can't dent or bulge... is enjoying a "boom" that will last our lifetime and yours.

So... to meet this insistent, increasing demand for LUMITE, we have built a plant that is not only modern in every respect *today*... but is also planned to cope with the inevitable production-expansion which many years of *tomorrows* will bring.

All plant equipment is up-to-the-minute... our looms the most modern to be had. Our craftsmen know their jobs from A to Z... and our Research and Testing Laboratory staff experiments endlessly to produce new uses for better merchandise.

This is the *only* plant in America built for the sole purpose of manufacturing plastic screen and fabric. On 300 acres of rolling Georgia countryside, this new plant will fill the ever-growing demand for LUMITE, giving you speedy and efficient service.

Write *today* for full information and samples of LUMITE Plastic Screen.

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A DOW CHEMICAL CO. PRODUCT

*REG. U. S. PAT. OFF.

WHY LUMITE IS A BEST-SELLER:

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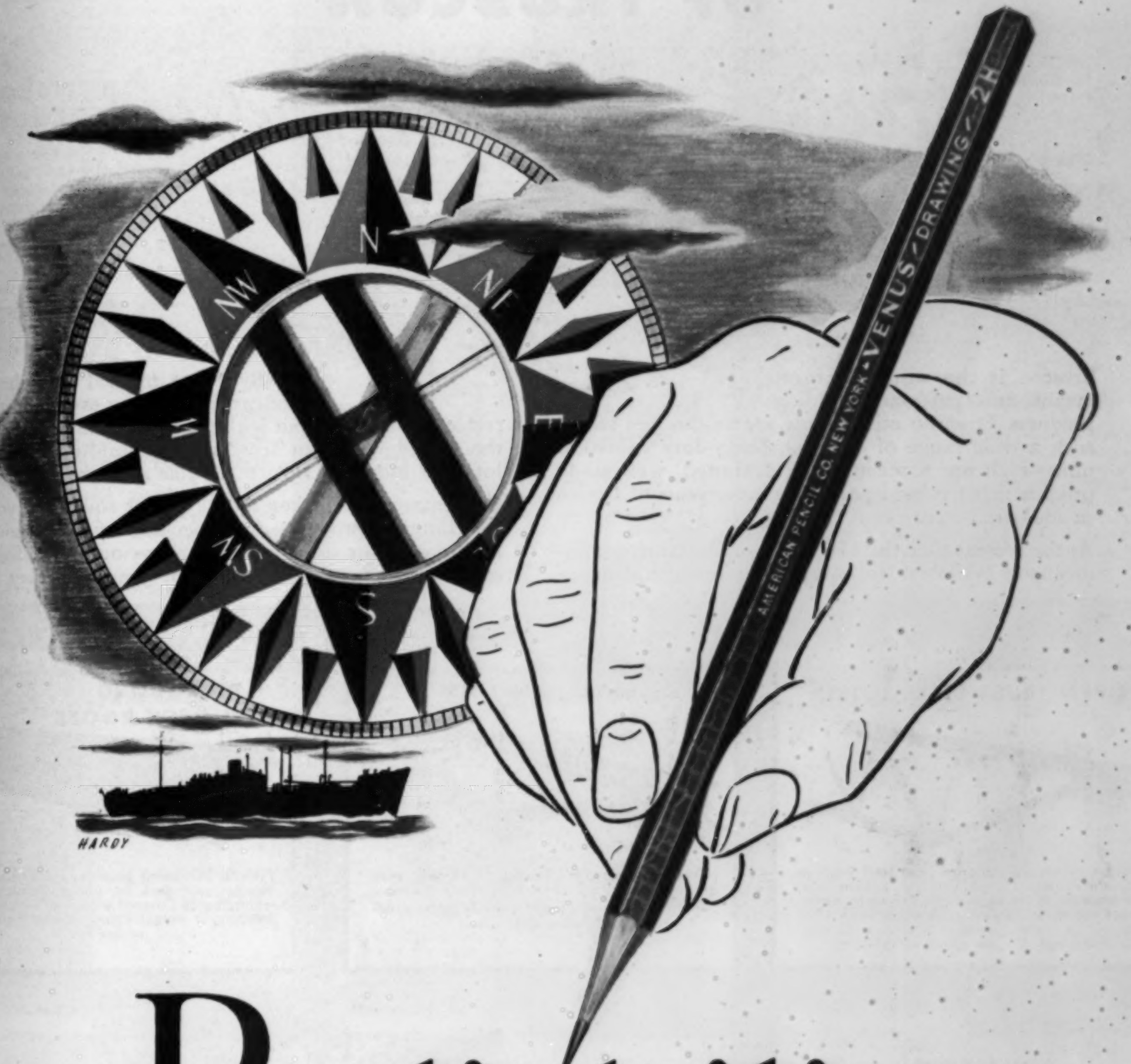
- WON'T BULGE
- CAN'T STAIN
- NO PAINTING
- CLEANS EASILY
- EASY TO HANDLE
- EASY TO FRAME
- NON-INFLAMMABLE
- TESTED COLOR
- LASTS LONGER
- AND STRONGER—Lumite is woven of heavy plastic filament (0.015" diameter)

CHICOPEE PRODUCTS

CHICOPEE MANUFACTURING CORPORATION
47 Worth Street, New York 13, N. Y.
World's largest maker of Plastic Screen Cloth



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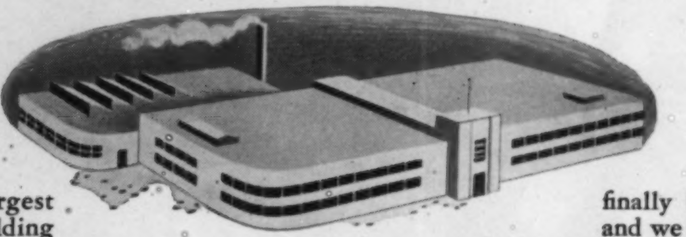
HERE'S YOUR CATALOG OF TRUSCON

Steel Building Products

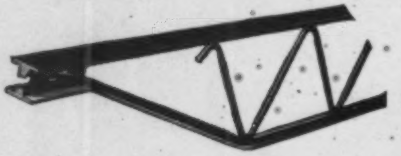


Truscon is the world's largest manufacturer of steel building products. From no other single source can you secure such a wide range of essential, heavy-duty structural units—each one a scientifically designed, well-made product that has been proved by many years of service in industrial structures.

At the present time these building products are not immediately available. However, our production plans are finally being molded into shape, and we are bending every effort to reach maximum output with the least possible delay. In the meantime, design Truscon Steel Building Products into the industrial structures you now are planning.

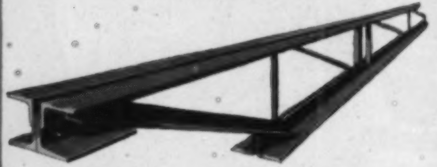
Concentrate on Truscon as the major source of your steel building products—for dependability, for responsibility, and for designing, engineering and delivery service, no matter where you or your job may be.

OPEN TRUSS STEEL JOISTS



Truscon developed the open truss steel joists to meet the demand for economical, light weight, fire-resistant floors in schools, hospitals, apartments and other light-occupancy buildings. They are easy to install. Completely shop fabricated, they reach the job ready for placing.

CLEARSPAN JOISTS

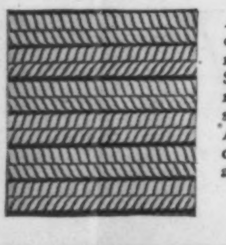


Truscon "Clearspan" Joists meet all clear span requirements up to 64 feet. They eliminate undesirable columns and provide greater unobstructed floor areas.

FERROBORD STEEL DECK ROOFS

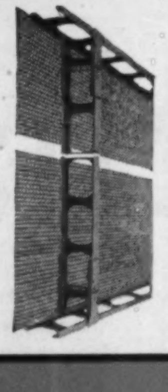
Truscon Ferrobord provides a fire-resistant, economical roof deck for all new construction or replacements. Covered with insulation and waterproofing, it weighs approximately 5 pounds per square foot.

DOUBLEMESH HERRINGBONE LATH



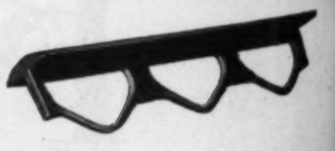
A plaster saving lath, designed for a perfect mechanical bond. Sheets are unusually rigid, allowing wider spacing of supports. A complete line of corner beads and other accessories will also be available.

HOLLOW PARTITION STUDS



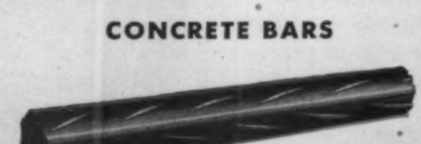
Truscon hollow partition studs assure permanence, rigidity and economy. They are fire-resistant, provide excellent heat insulation, and sound resistance, are rodent and termite proof. They will not swell or warp and will resist impact, vibration or plaster cracking.

CURB BARS



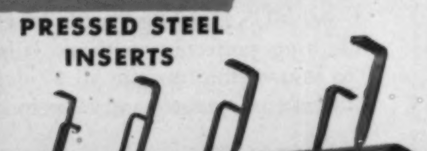
Protect exposed corners of concrete curbs, walks, steps, etc. Designed to give positive anchorage into the concrete. Plate surrounds and protects the corner without splitting concrete into two portions.

CONCRETE BARS

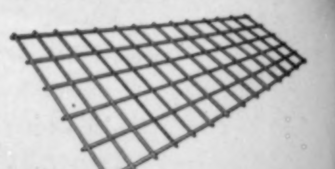


A special rolled section of high grade steel, with a series of longitudinal and diagonal ribs, so designed to provide the maximum bond with the enclosing concrete.

PRESSED STEEL INSERTS



Truscon Slotted Inserts are attached to the forms and are completely imbedded in the concrete. Bolt can be moved along slot to any location, allowing wide variation in position. Used in ceilings, slabs, beams or columns.

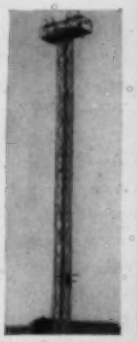


WELDED STEEL FABRIC

Truscon Welded Steel Fabric is made in various sizes for concrete reinforcing in all types of structures, and highways. Each joint is electrically welded for permanence.

FLOODLIGHT TOWERS

Made in a wide selection of heights, they offer a firm, long-lasting floodlight tower for railroad sidings, airports, factory yards, etc.

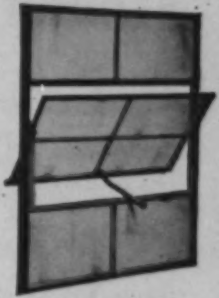


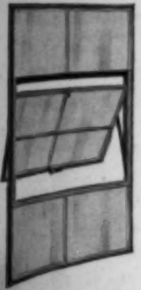
PIPE LINE SUPPORTS

Weltrus Pole sections provide ideal pipe line supports. Correct as to engineering, neat in appearance, economical, permanent and efficient in operation.

PIVOTED WINDOWS

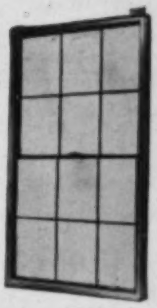
Adaptable to all types of industrial and commercial buildings. Easy to open and close. Come in a wide range of sizes.





COMMERCIAL PROJECTED WINDOWS

Used widely in buildings where appearance, shading and screening convenience and low cost are required.



DOUBLE-HUNG WINDOWS

Electro-Galvanized steel, bonderized and finished with baked-on priming coat of paint, guaranteed spring balances, factory installed weatherstripping, and attractive hardware. Shipped completely assembled ready for installation.

CONTINUOUS WINDOWS

Continuous windows provide large glass areas for admitting daylight and controlled ventilation. Used with properly designed mechanical operators, it is possible to open and close all the windows in each bay or several adjacent bays through one control.

MECHANICAL OPERATORS

Lever Arm or Rack and Pinion Types for operating long runs of Pivoted or Projected Windows.

CRANE DOORS

Frequently the cost of this type door can be saved in a single season due to increased efficiency of workmen and fuel savings. Door leaf can be completely filled with sash to permit maximum transmission of daylight. Doors open and close quickly. Usual electric operating speed is 45 feet per minute.

SWING AND SLIDE DOORS

Truscon swing and slide doors are adaptable for use in basements, rear entrances, boiler rooms, fire exits and similar places in residences, hotels, apartments, schools, churches, shops, warehouses, factories, filling stations and stores. They are durably made for heavy usage.

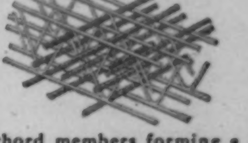
VERTICAL LIFT DOOR

Consists of two leaves, each approximately one-half the opening height, sliding vertically upward. The meeting rail-joint between the two leaves is effectively weathered. Rubber weathering can also be applied at the top and to the bottom rail.

TWO SECTION TURNOVER DOOR

Designed for rapid operation, they are effective barriers to infiltration of cold air and resultant heat loss in industrial buildings of all types. An important advantage of this type door is the reduced clearance required inside the building for opening and closing these doors.

BANK VAULT REINFORCING



Truscon Welded Bank Vault Reinforcing consists of welded steel units placed parallel to each other with their chord members forming a barrier of steel near the inner and outer faces of the walls, floor and ceiling slabs. The web members of the welded units provide reinforcement through the thickness of the concrete.

TRUSCON STEEL COMPANY

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Manufacturers of a Complete Line of Steel Windows and Mechanical Operators . . . Steel Joists . . . Metal Lath . . . Steeldeck Roofs . . . Reinforcing Steel . . . Industrial and Hangar Steel Doors . . . Bank Vault Reinforcing . . . Floodlight Towers . . . Bridge Floors.

REQUIRED READING

HOUSES TO BUILD

New Homes for Today. By Paul R. Williams, A.I.A. Hollywood, Calif., Murray & Gee, Inc., 1946. 8½ by 11 in. illus. $2.00.

This new book by Paul Williams has all the popular appeal of his earlier "The Small Home of Tomorrow." Predominantly a book of plans, it has an introductory chapter discussing the problems that every family faces as it sets out to build its own house. Here, in concise form, are a consideration of the pros and cons of the one-story home as against the two-story, the current trends in planning, the technical matters such as heating and air conditioning, the possibilities of remodeling, the principles of furnishing and decorating, the problem of site selection — all topped off with a practical list of Do's and Don'ts in building.

The plans Mr. Williams has assembled here are varied enough to suit every taste. Some are as distinctly modern as others are distinctly traditional, but most are small, and all show a shrewd sense of good space usage. It is a nicely balanced, attractive collection of which any architect could well be proud.

AND MORE HOUSES

If You Want to Build a House. By Elizabeth B. Mock. Illustrated by Robert C. Osborn. New York (1230 Sixth Ave.), Simon and Schuster, Inc., 1946, for the Museum of Modern Art. 7½ by 10 in. 96 pp. illus. $2.00.

Very different in character is this second book on the art of home building. It is an out and out appeal for the so-called modern style. "Only in modern architecture," Mrs. Mock writes, "is any serious attention given to the peculiar problems of the small house." She isn't advocating, however, that boxlike, hospital-clean, impersonal functionalism which all too often passes for modern. Take what she says of the kitchen, for example: "A kitchen is more than the sum of its gadgets. . . . Hard, smooth-surfaced materials are, of course, easy to clean, but that doesn't mean that the entire kitchen must look like the inside of an ice-box. Can't we achieve, in contemporary terms, something of the rich and warmly human dignity which still seems to characterize peasant kitchens all over the world?"

Mrs. Mock has chosen well from among the best examples of modern small-house architecture. Frank Lloyd Wright, Harwell Hamilton Harris, Richard J. Neutra, Marcel Breuer, Wurster and Bernardi, Pietro Belluschi — these are some of the architects represented. Examples of their work are used to illustrate Mrs. Mock's various chapters on space for living, plenty of light, making small houses seem large, and so on. Even though this quite obviously is intended as a book of ideas rather than as a workbook, it is curious that not a single floor plan has been included.

VIVIFYING COMMUNITIES

Rebuilding Our Communities. By Walter Gropius. A lecture given at the Institute of Design, Chicago. Chicago 2 (5 N. Wabash Ave.), Paul Theobald, 1945. 8½ by 11 in. 62 pp. illus.

In common with the majority of city planners, Walter Gropius stresses as a necessary first step in city rehabilitation the reawakening of community interest and spirit. Every citizen must be permitted to participate actively in the community life, he says. "To attain this, our administrative framework must be humanized. It should be based on self-contained neighborhood units, small enough to serve as organisms for reactivating normal social intercourse."

"Such a self-contained neighborhood unit," he explains, "would have from five to six thousand inhabitants, the minimum number needed for an efficient elementary school. The next larger administrative unit would be a precinct in the city, or a county in the country, each comprising a cluster of from six to 10 neighborhood units — say 30 to 50 thousand people. Finally, the largest unit is the entire city or metropolis itself."

Daily commuting time should not exceed 30 or 40 minutes, Mr. Gropius says, and the size of neighborhood units should be limited by walking distances. Legal instruments should be developed that could channel any housing development, private as well as public, into a controlled and balanced communal organization. Land ownership and use should be regulated by legislation.

Two less familiar ideas are advanced by Mr. Gropius. First, that cities could be relieved from congestion by the siphoning out of "those people who cannot be permanently employed in the city," and the resettling of them, together with some smaller industries, in neighborhood units to be built in the country. And second — a new proposal well worth serious consideration — the building by each state of at least one model neighborhood community as a memorial to the dead of World War II.

A TOWN SURVEYED

A Comprehensive Municipal Plan for Lancaster, Pennsylvania. Prepared by Michael Baker, Jr. Rochester, Pa., The Baker Engineers, 1945. 8½ by 11 in. illus.

When Michael Baker sets out to do a planning survey, he does a thorough job of it. As in his study of Beaver County, Pa., published almost two years ago (see AR, Oct., 1944, p. 26), this survey of Lancaster covers every possible facet of development and need. The city's history is sketched from the beginning to the present day, with full attention paid to the background of the early settlers. Present-day standards of living, land use, occupations, industries, commerce and agriculture are analyzed in detail. Population characteristics and trends are studied. The physical development of the community is examined almost with a microscope. And with all of this careful analysis as a background, specific recommendations are made and a program for future action is presented.

DRAWING TEXTBOOK

Simplified Architectural Drawing. By Truman C. Buss, Jr. Chicago 37 (Drexel Ave. at 58th St.), American Technical Society, 1946. 8¼ by 11 in. 258 pp. illus. $4.75.

Here is a basic textbook, complete with examples and graded problems, for the use of architectural students. Its author, a registered architect, is the head of the department of architectural drawing at the Pullman Free School of Manual Training in Chicago — a happy background for a book of this kind.

Divided into sections on technique, working drawings and construction, and display drawing, the book is easy to work with. It does not skimp anywhere along the line either on explanation or on illustration. Nor does it presuppose any previous training in the field. With its generous number of problems, its reading list and its index, it is the sort of textbook that both instructors and students should welcome.

PLASTICS BIBLE

Modern Plastics Encyclopedia: 1946. New York 17 (122 E. 42nd St.), Plastics Catalogue Corp., 1946. 8¼ by 11¼ in. 1390 pp. illus. $6.00 ($7.00 outside the United States).

Year after year the Plastics Catalog gets bigger and better, more attractive, and easier to work with. And year after year it faithfully reports the latest developments in the plastics field. It is really appalling the way the thing grows: the 1945 edition was almost 200 pages longer than the 1944, and the 1946 edition adds still another 212 pages!

The most noticeable and welcome change from previous editions is the peacetime aspect of the new volume. For several years the catalog has fairly bristled with things military; it is both pleasant and somehow reassuring to find in this volume pleasure boats instead of PTs, dresser sets instead of mess kits, civilian rather than military models and needs. No longer is the introductory section of the volume concerned with wartime developments and applications; instead there is a "Plastics

(*Continued on page 28*)

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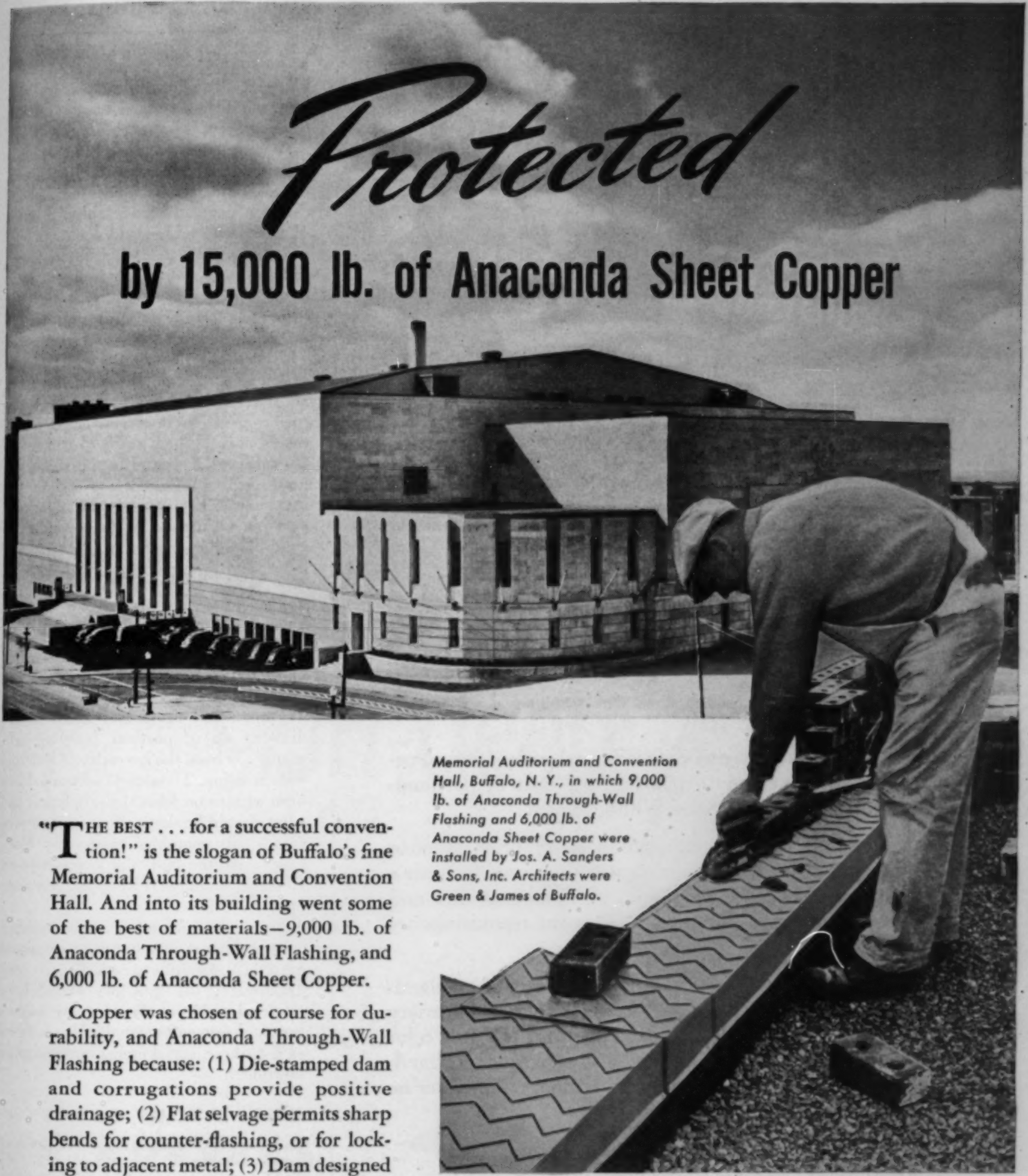

Memorial Auditorium and Convention Hall, Buffalo, N. Y., in which 9,000 lb. of Anaconda Through-Wall Flashing and 6,000 lb. of Anaconda Sheet Copper were installed by Jos. A. Sanders & Sons, Inc. Architects were Green & James of Buffalo.

"THE BEST . . . for a successful convention!" is the slogan of Buffalo's fine Memorial Auditorium and Convention Hall. And into its building went some of the best of materials—9,000 lb. of Anaconda Through-Wall Flashing, and 6,000 lb. of Anaconda Sheet Copper.

Copper was chosen of course for durability, and Anaconda Through-Wall Flashing because: (1) Die-stamped dam and corrugations provide positive drainage; (2) Flat selvage permits sharp bends for counter-flashing, or for locking to adjacent metal; (3) Dam designed so as to permit placing edge within ¼ inch of face of wall, and still allow for pointing of mortar; (4) Thoroughly water-tight joints are formed when flashing is locked endwise by nesting one or two corrugations.

For detailed description and suggested specifications, write for Publication C-28, or refer to Sweet's Architectural Catalog.

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Health Center Building, Royal Oak, Michigan

No damp and grimy areas deface the exterior of this structure. It has been treated to a protective coat of portland-cement paint—made with Atlas White Cement.

When applied to concrete, concrete masonry, brick, stone or hollow tile, this sturdy finish penetrates the pores to form a permanent bond. It resists moisture . . . combats dirt and dust. Saves money, too . . . because frequent repaintings are unnecessary.

Atlas White Cement is used by manufacturers of portland-cement paint as a base for natural white and for a wide variety of colors—to bring out clearly, permanently, the full color values of the pigments used. Conveniently packaged, portland-cement paint is ready for mixing with ordinary tap water on the job.

For full details, write to Atlas White Bureau, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

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FOR PORTLAND-CEMENT PAINT

U. S. STEEL RADIO SHOW — Sunday Evenings — Consult your local newspaper for time and station.

REQUIRED READING

(*Continued from page 28*)

Panorama" telling what plastics are, what methods and machines are used in forming them, what they are used for.

How the plastics industry is growing is indicated in a chapter on facts and figures. The technical data section includes a detailed bibliography, a series of charts and tables, and complete specifications. The exhaustive materials section has been thoroughly brought up to date. The excellent group of charts which has formed an important part of previous volumes has been augmented with two additions — the SPI classification of plastic molding materials, and an adhesives chart — and has been issued separately in an envelope (extra copies may be had at $3.75 the set of 10) rather than bound in the volume as has been done heretofore; whether or not this separation will prove an advantage is a moot question. The appendix includes a bibliography, a glossary, the index, and a directory of manufacturers.

FOR BETTER CODES

Your Building Code. By Miles L. Colean. New York 18 (512 Fifth Ave.), National Committee on Housing, Inc., 1946. 6 by 9 in. 30 pp. 35 cents.

Emphasized again and again in the drawing up of postwar building programs has been the necessity of building code revision. Thousands of words have been written on what the problem is and what should be done about it. And now comes this pamphlet written by Miles Colean for the National Committee on Housing, summing it all up in a few short pages.

Mr. Colean finds six main building code problems: (1) what the code should cover; (2) scientific standards; (3) nonuniformity; (4) multiple jurisdiction; (5) legal rigidity; (6) adequate inspection and fair enforcement. He analyzes each of these, and sketches out a possible solution.

MORE ABOUT CODES

Building Code Modernization (A Series of Reference Bulletins). New York 1 (350 Fifth Ave.), American Iron and Steel Institute, 1946. 6 by 9 in. 70 pp.

A handy companion to Miles Colean's analysis of the building code problem is this series of eight papers on both general and specific code considerations The bulletins include facts related to the purpose and legal limitations of building codes, contents and arrangement, building classification, fire hazards, fire protection and exit regulations, structural standards, etc. They are based on a study of building practices throughout the United States, started in 1938 and carried out by the Institute's Committee on Building Codes.

Almost any roof looks good when it is new. The real test comes after it has been exposed to tough conditions . . . to water lying in low spots . . . to breaks caused by vibration . . . to years, years, years.

That is why roofs are like beauty that is skin deep.

If a roof fails for any reason, the client is apt to think you are to blame. That is why it is safest to specify the kind of roofing materials that long years of experience have proved will last . . . roofing whose "beauty" goes clear through to the deck. Your safest bet is coal tar pitch roofing. With all the improvements that have been made in other things, no one has been able to find any better built-up roofing than this old true-and-tried material. For your own sake, as well as for the sake of your client, specify coal tar pitch.—Koppers Company, Inc., Tar & Chemical Division, Koppers Building, Pittsburgh 19, Pa.

Why are roofs

sometimes like

"skin-deep"

beauty?

KOPPERS
coal tar built-up roofing
KOPPERS
coal tar membrane waterproofing

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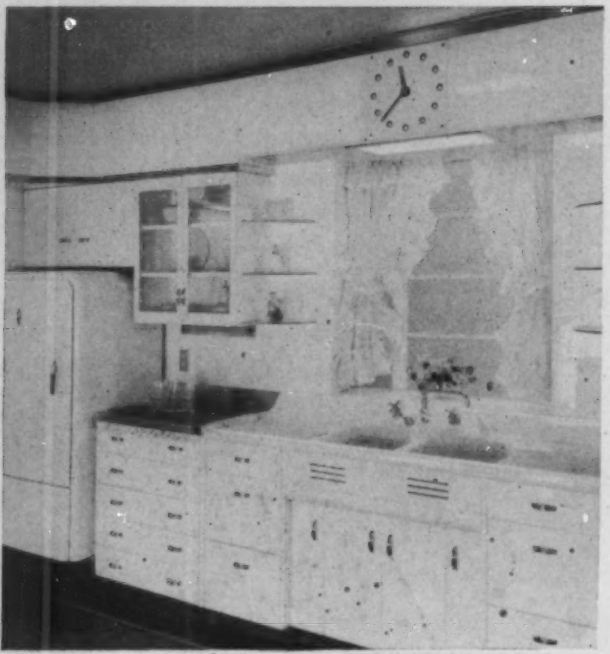
DESIGN POSSIBILITIES FOR RESIDENCES ... with Glass



The modern home combines beauty, utility, and efficiency. That's why wainscots or walls of Carrara Structural Glass are so frequently specified in architect's kitchen and bathroom designs. Carrara is permanent, easy to clean, unsurpassed in beauty. It is available in ten attractive colors and in a wide range of thicknesses. Architect: Stiles Clements.

The trend toward more and larger window areas calls for the use of quality glass for glazing. Pennvernon Window Glass is widely used for general glazing because it has an unusually high degree of clarity, good looks, and freedom from distortion. For glazing larger areas, lustrous Pittsburgh Plate Glass is recommended.

Striking effects can be obtained by using Pittsburgh Mirrors. Small rooms can be made to seem larger, narrow rooms wider, dark rooms lighter. Available for your designs are mirrors of blue, flesh tinted, green, or regular Plate Glass and gold, silver, or gunmetal backings. Interior by Mabel Cooper Bigelow and E. Chas. Werner. Architect—Rollin Pierson.

PITTSBURGH PLATE GLASS COMPANY

More and more, the outdoors is being brought into the home by the use of large picture windows and panels of glass. Such generously-proportioned glass areas, without cross-sash of any kind to interfere with vision, enable the architect to take full advantage of attractive surroundings in designing gracious homes. Pittsburgh Polished Plate Glass is the practical choice for applications like this. It is brilliantly reflective of surface, enhancing substantially the exterior appearance of the home. And it affords clear, undistorted vision through it from any angle. Architect—A. S. Alschuler.

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● Any architect, engineer, contractor, utility director or city commissioner interested in efficient power distribution will find this case history extremely helpful. It shows how, by adding steam sales, the Piqua Municipal Power system was able to plan a long range expansion program on a sound basis—at the same time bringing to the community all the benefits of "Central Heating"—smoke and soot abatement, reduction of fire hazards, fuel and manpower savings resulting from elimination of individual heating plants and of private coal delivery and ash removal. It also shows the important part Ric-wiL played by providing a modern steam distribution system.

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That's because wire insulated with GEON offers so many advantages—excellent electrical properties, to name one of the most important. Insulation made from GEON is flame resistant; increases safety, reduces fire hazard. Because of its outstanding electrical properties insulation made from GEON may be used in thin coatings which means more conductors per conduit. It's smooth, too, easy to handle and install; quickly identified because the entire NEMA color range is available. And, of course, it's Underwriters' approved.

As soon as the house is completed, more wire insulated with GEON will make its appearance. It may be in the form of appliance, lamp, and telephone wire. Or it may be the hookup wire now being used in modern radio sets and other electrical devices.

All of GEON's advantages are available to users in domestic, industrial or utilities wiring. The next time you order wire or cable from your supplier be sure to specify insulation made from GEON. Or for help with specific applications please write Dept. A-6, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio.

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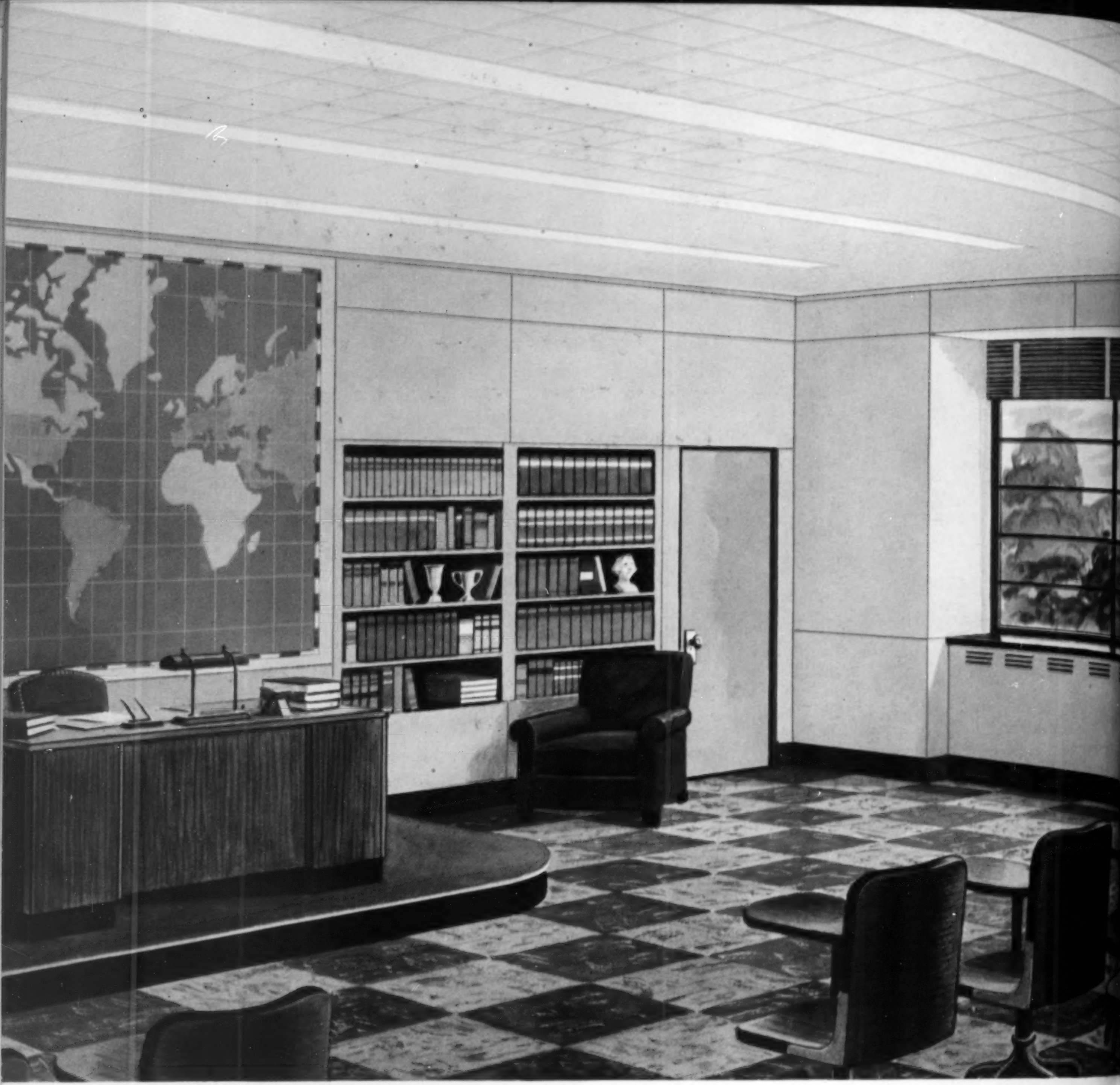

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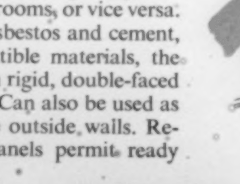
MOVABLE WALLS—The keystone of flexibility in Unit Construction is the J-M Transite Wall. Can be disassembled and relocated as needs require. One-unit rooms, for instance, can be speedily converted into two-unit rooms, or vice versa. Made of fireproof asbestos and cement, practically indestructible materials, the movable panels form rigid, double-faced partitions, 4″ thick. Can also be used as interior finish of the outside walls. Removable Transite panels permit ready access to wiring, etc.

ACOUSTICAL CEILINGS—Important factor in helping to overcome the handicap of distracting noise, Johns-Manville Acoustical Ceilings are beneficial both to teacher and student alike. They give the desired degree of quiet for effective teaching, and are proved aids to concentration. An exclusive Johns-Manville patented construction system permits interchangeability of flush-type fluorescent lighting and acoustical units, which are readily demountable.



COLORFUL, RESILIENT FLOORS—J-M Asphalt Tile Flooring completes the Unit Construction System. Made of asbestos and asphalt, the units withstand hard wear, yet are comfortable and quiet underfoot. Individual units permit easy alterations or extension of patterns. Made in a wide variety of plain and marbleized colors.

A lecture room now, it may be a laboratory tomorrow —expanded or rearranged to meet a new need! That's the structural flexibility made possible by the Johns-Manville Unit Construction System.

"Structurally flexible"

Yes! This attractive university lecture room can be enlarged, subdivided, or even relocated!

Johns-Manville Unit Construction provides the complete interior for schools and colleges . . . offers many new advantages

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Whenever educational needs present new requirements, you can expand, convert, or subdivide interiors built with Johns-Manville Walls, Ceilings, and Floors.

You can vary the size or arrangement of rooms and corridors . . . make endless revisions of space-use . . . and do it economically, quickly, without waste of material!

Also, this proved method of construction makes the whole interior—walls, ceilings, floors—available under *one* specification, *one* manufacturer's responsibility. Each material contributes individual advantages:

1. **Movable Walls** . . . readily assembled . . . are interchangeable . . . 100% salvageable. Made of sound-resistant, asbestos-cement Transite panels . . . hard to mar, easily cleaned by a simple washing—advantages that make a big difference in the maintenance budget.
2. **Acoustical Ceilings** . . . attractive . . . demountable . . . reduce distracting noise. Units can be taken down and relocated as desired.
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All these constituent parts are durably built to last as an *integral* part of the building. Write for further information and details on this significant development in the construction of educational buildings. Address Johns-Manville, Department AR-6, P. O. Box 290, New York 16, N. Y.

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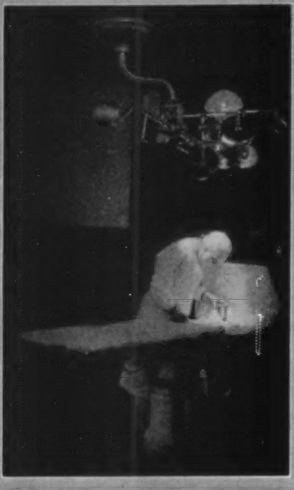
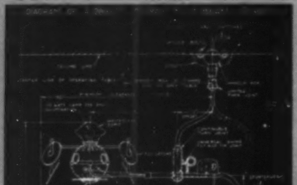
get this helpful advance information about...

"BUILT-IN" FACILITIES FOR MODERN HOSPITALS

Properly coordinating installations of recessed and built-in hospital equipment not only calls for the experience of specialists, but also requires the benefits of knowledge that can be acquired only through extensive contacts with hospital management personnel.

More than 40 years of such contacts and of experience in designing and manufacturing major equipment such as sterilizers, surgical lights, and instrument and supply cabinets, have qualified the Technical Sales Service Department of the Scanlan-Morris Division to supply valuable data and assistance to architects in planning hospital construction. Call on us, without obligation, for information and assistance on the types of products illustrated below.





← *Scanlan-Morris Built-In Surgical Lights*—Operay Multibeam lights, widely used in the operating rooms of prominent hospitals, can be adequately planned with the aid of the 56-page Scanlan-Morris Surgical Lighting Catalog. Contains installation drawings and complete information on standard models, emergency models and explosion-proof models.

Scanlan-Morris Built-In Sterilizers include models to meet every requirement of the modern hospital—individual sterilizers and batteries, for any type of heat. Also exposed types. Complete catalog includes both pressure and non-pressure sterilizers, cylindrical and rectangular autoclaves, and extensive planning and installation drawings and data.

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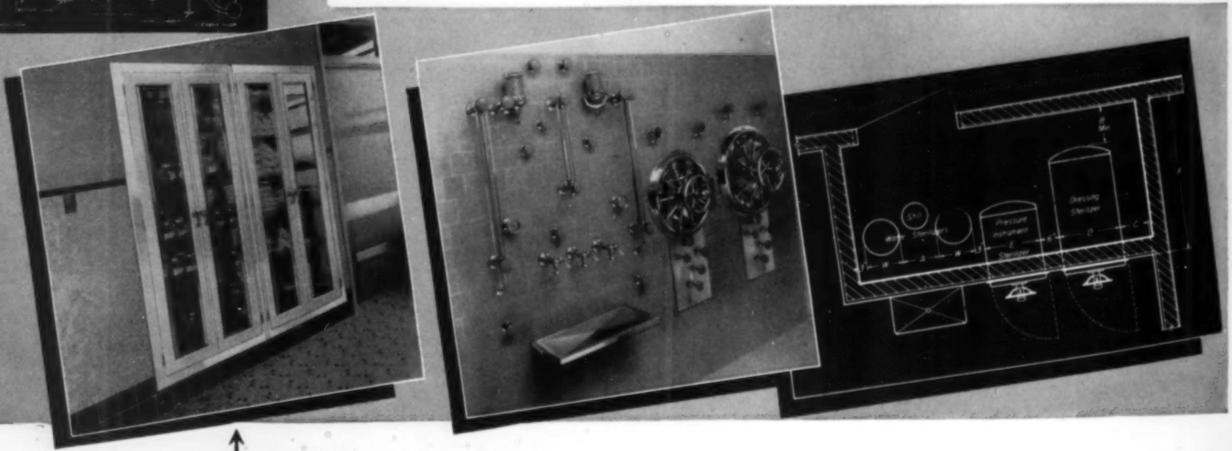

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Scanlan-Morris Recessed Instrument and Supply Cabinets are made of 20-gauge furniture steel, in a wide variety of styles and sizes; built from plans and specifications covering the individual requirements of the hospital.

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Hospital architects are invited to send for literature and planning data on Surgical Lighting, Sterilizers and Recessed Cabinets, and for suggested layouts of equipment based on floor plans.

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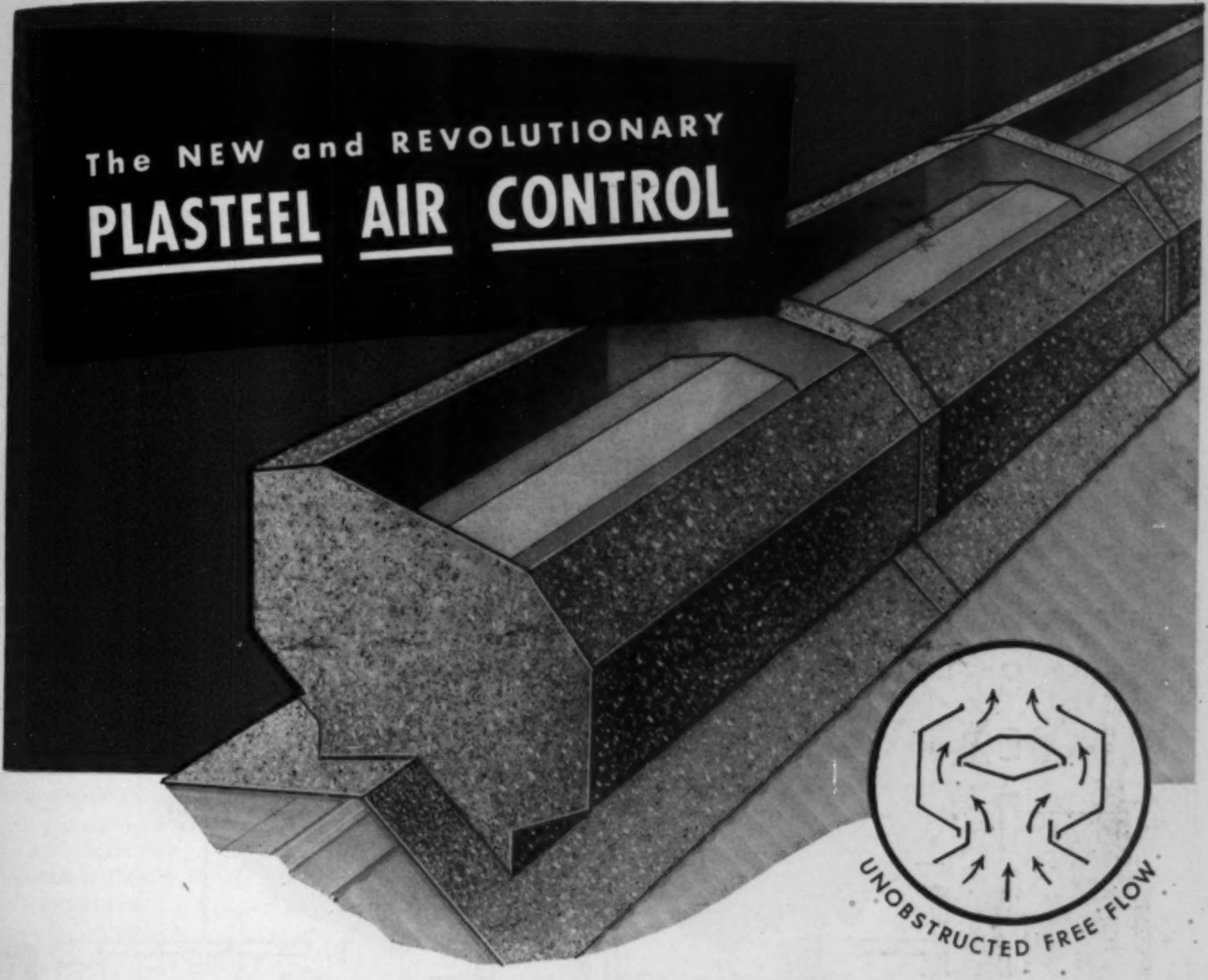

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"PASSIVATES" METAL
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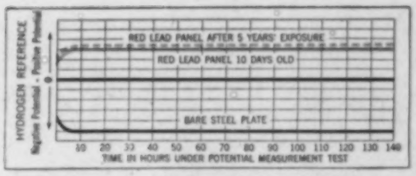

Scientific Proof of Red Lead's Protective Effect

In this test, a piece of unpainted steel was immersed in water. Iron, going into solution, reacted with oxygen in the water to form rust. This unrestrained corroding state is indicated by a rapidly developed and maintained negative potential relative to hydrogen (see above graph).

However, when steel panels painted with Red Lead were immersed under the same conditions, iron and lead salts formed directly next to the metal. This action at once stifled corrosion by preventing the iron from going into solution, thus keeping the steel surface passive. The result is shown in the graph curves above, where a quickly rising positive potential remains constant throughout the test.

Proven performance through the years won for Red Lead its wide acceptance by industry as the standard paint for protecting metal.

But it remained for modern research to show the reasons *why* Red Lead is such an effective guardian against rust. One of the most important of these is Red Lead's ability to keep iron and steel in a "passive" state, in which rusting activity is reduced to a minimum.

As is well known, bare, unprotected steel exposed to moisture rapidly rusts.

However, the same steel protected by Red Lead remains in a "passivated" or rust-inhibited condition.

This non-corroding state of Red-Leaded steel, as compared with unprotected steel, can be measured electrically. See accompanying graph.

It is worth noting that, even after five years' exposure, the "passivating" power of Red Lead is still retained. No wonder, then, that Red Lead is considered the foremost paint for making metal *last.*

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The value of Red Lead as a rust preventive is most fully realized in a paint where it is the only pigment used. However, its rust-resistant properties are so pronounced that it also improves any multiple pigment paint. No matter what price you pay, you'll get a better metal paint if it contains Red Lead.

Write for New Booklet—*"Red Lead in Corrosion Resistant Paints"* is an up-to-date, authoritative guide for those responsible for specifying and formulating paint for structural iron and steel.

It describes in detail the scientific reasons why Red Lead gives superior protection. It also includes typical specification formulas . . . ranging from Red Lead-Linseed Oil paints to Red Lead-Mixed Pigment-Varnish types. If you haven't received your copy, address nearest branch listed below.

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The benefit of our extensive experience with Red Lead paints for both underwater and atmospheric use is available through our technical staff.

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Red Lead

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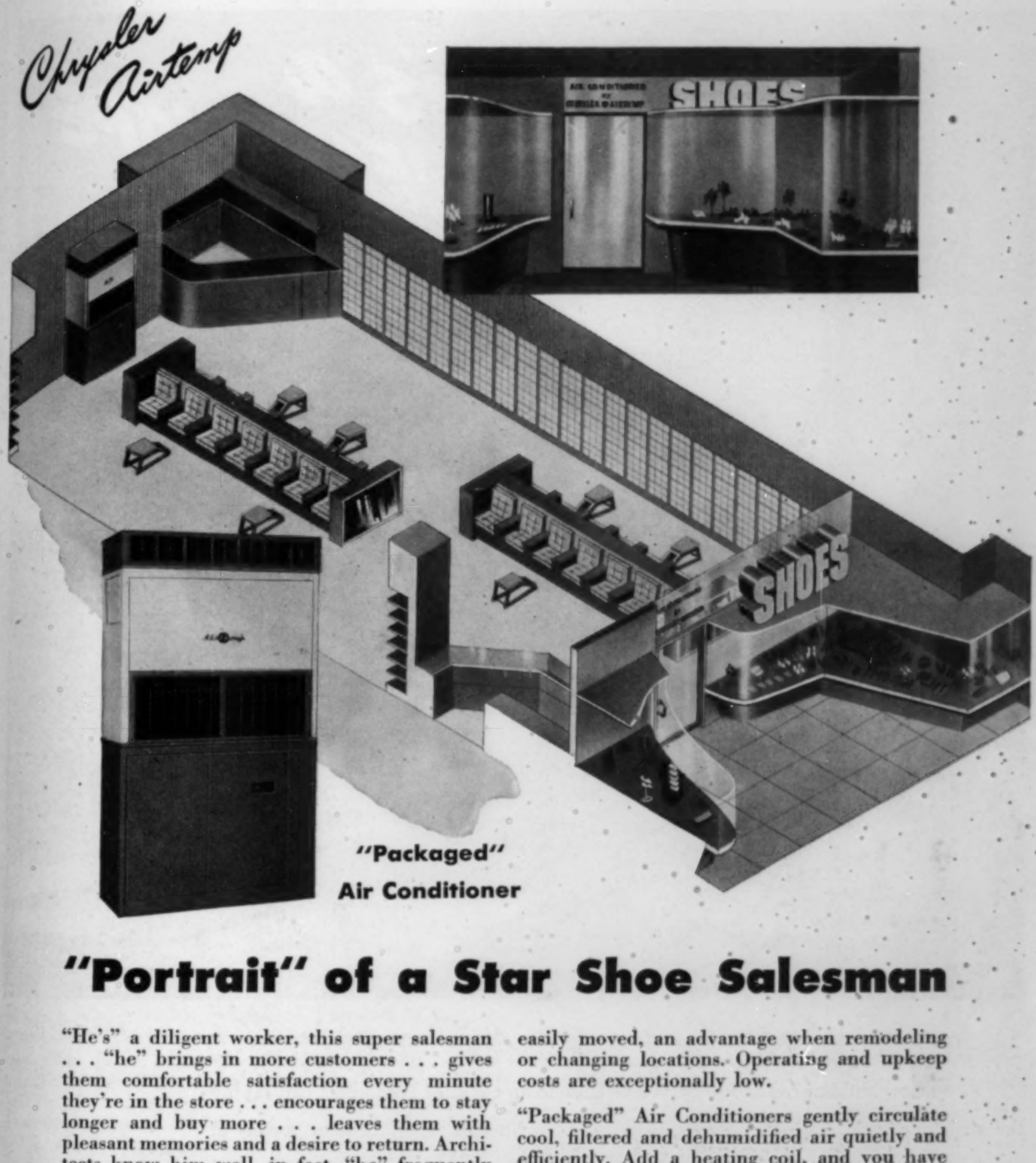
Built-in conduit to carry telephone wires within the walls, with telephone outlets at all handy locations, are a mark of good planning and sensible construction. Prospects will expect these features — in small homes as well as large ones. The cost is small for the extra convenience and room beauty.

Your Bell Telephone Company will be glad to help you plan for them. Just call your Telephone Business Office.

Room planned by George Daub, Philadelphia, Architect

BELL TELEPHONE SYSTEM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SHOES
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"Portrait" of a Star Shoe Salesman

"He's" a diligent worker, this super salesman . . . "he" brings in more customers . . . gives them comfortable satisfaction every minute they're in the store . . . encourages them to stay longer and buy more . . . leaves them with pleasant memories and a desire to return. Architects know him well—in fact, "he" frequently gets his star selling jobs through architects' recommendations. They know "him" as the Chrysler Airtemp "Packaged" Air Conditioner.

This simplified form of air conditioning, pioneered by Chrysler Airtemp, is ideal for stores of all types. "Packaged" Air Conditioners, with the famous sealed compressor, are engineered for long, dependable life. They are compact and easily moved, an advantage when remodeling or changing locations. Operating and upkeep costs are exceptionally low.

"Packaged" Air Conditioners gently circulate cool, filtered and dehumidified air quietly and efficiently. Add a heating coil, and you have year 'round air conditioning.

Also of first importance to architects is the small amount of floor space occupied by "Packaged" Air Conditioners and the fact that, singly or in multiple, they are easy to install. For full particulars, write Airtemp Division of Chrysler Corporation, Dayton 1, Ohio; or, in Canada, Therm-O-Rite Products, Ltd., Toronto, Ontario.

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FORMICA MEANS SUBSTANTIAL SAVINGS

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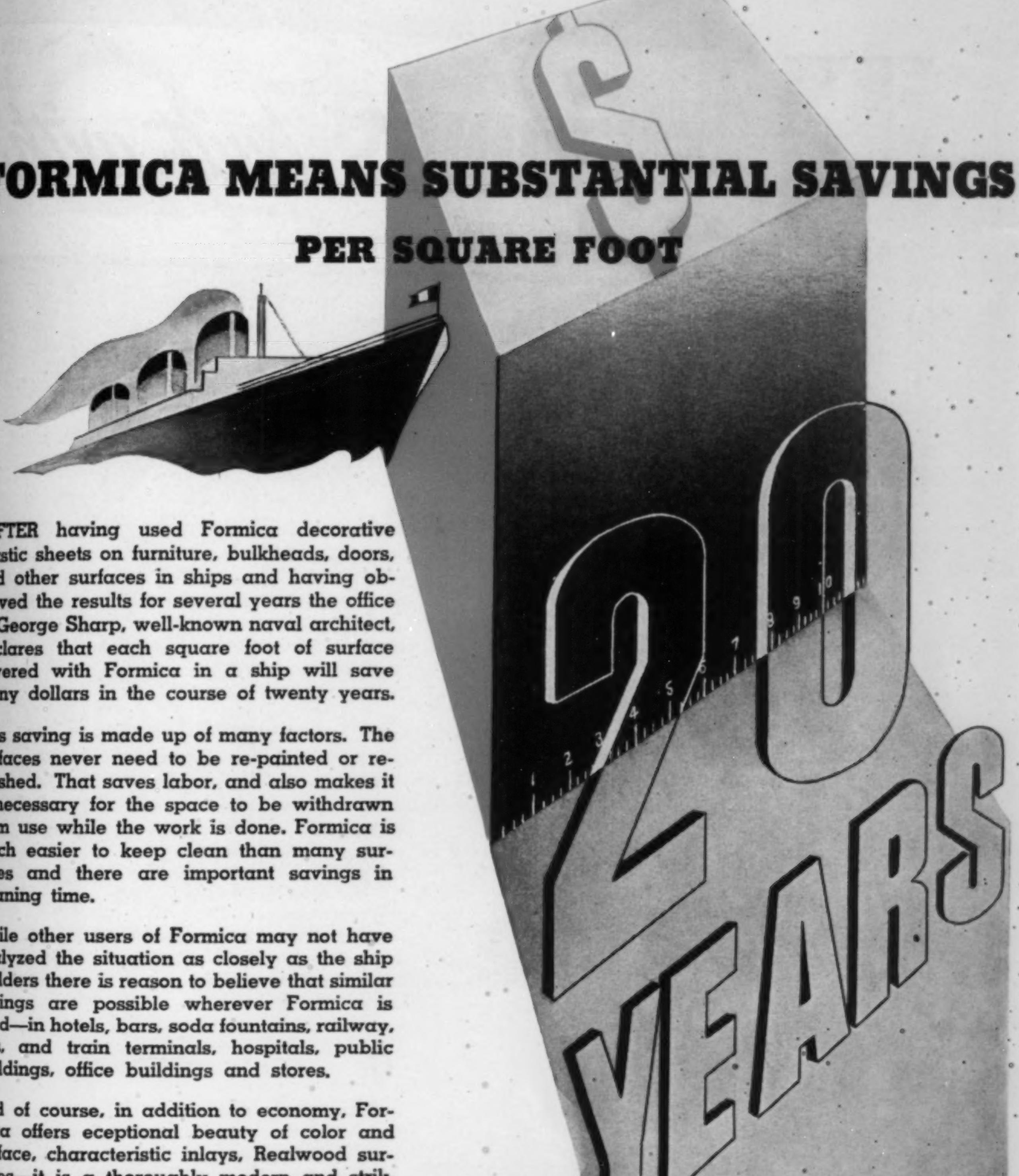

AFTER having used Formica decorative plastic sheets on furniture, bulkheads, doors, and other surfaces in ships and having observed the results for several years the office of George Sharp, well-known naval architect, declares that each square foot of surface covered with Formica in a ship will save many dollars in the course of twenty years.

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While other users of Formica may not have analyzed the situation as closely as the ship builders there is reason to believe that similar savings are possible wherever Formica is used—in hotels, bars, soda fountains, railway, bus, and train terminals, hospitals, public buildings, office buildings and stores.

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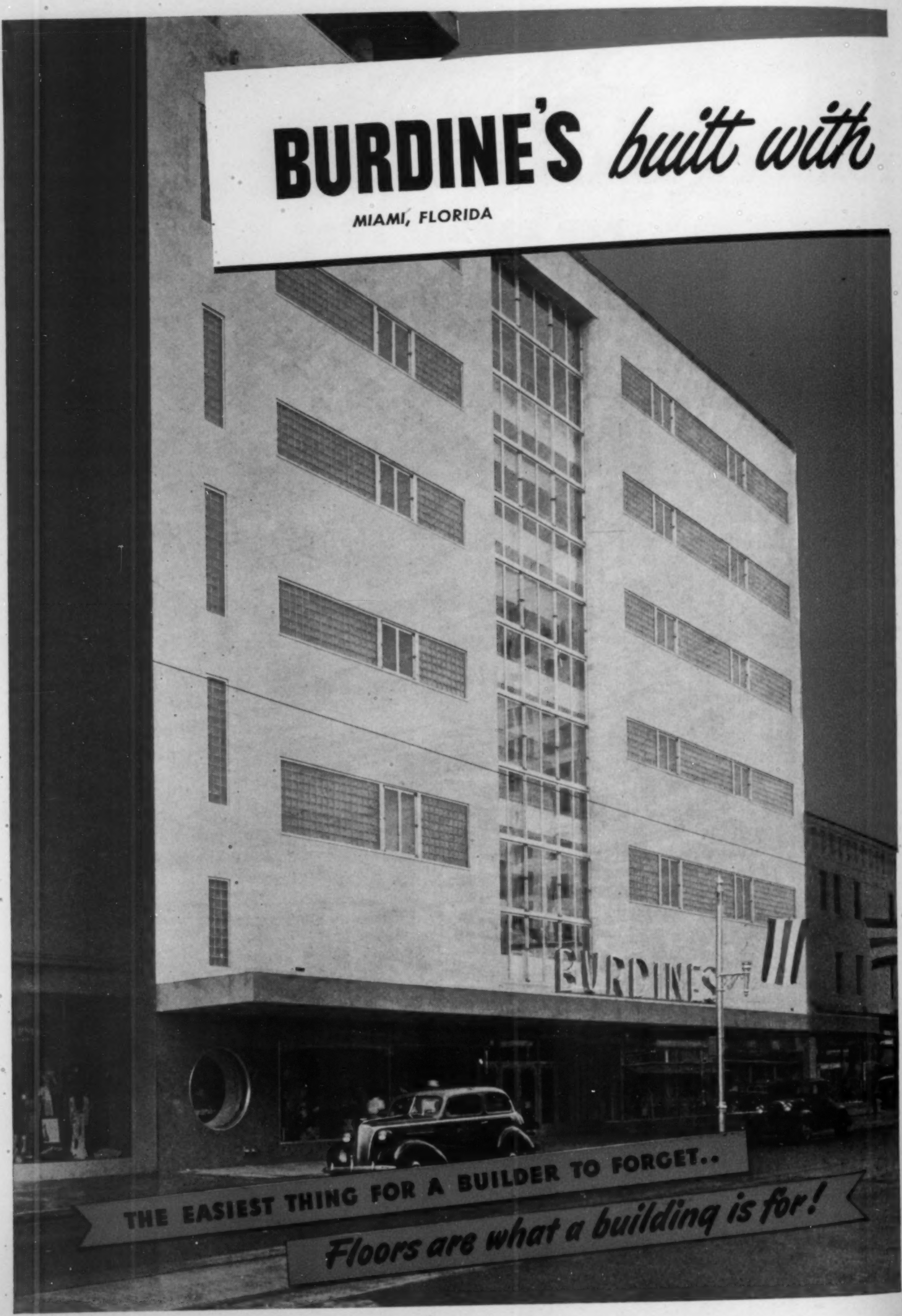
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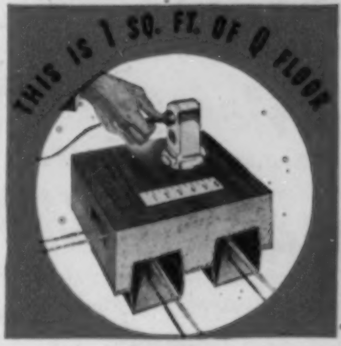
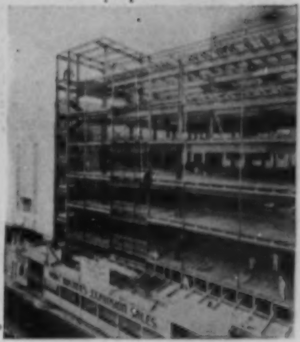
Q • FLOORS *because..*

Q-Floors gave E. L. Robertson, Miami and John R. Weber, New York, architects, *freedom from all floor plan headaches.*





You have no worry about change of floor plans, even in a building where frequent change is essential to the business, if you are working with Q-Floors.

Burdine's department store, for example, rolled back the rug display one night, tapped the Q-Floors for electrical outlets and set up the demonstration of sewing machines, pictured on the right, with each machine having an outlet.

An outlet takes literally only a few minutes to install on Q-Floors. A Q-Floor is steel cells crossed over by raceways in such a manner that any six inch area can be tapped for power. An electrician merely drills through a thin concrete fill. No trenches with their mess and muss. Think what this means in terms of flexible floor layout.

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Q-Floors construction advantages and the *over-the-years* electrical advantage would justify premium costs. But—costs are right in line. You don't have to hedge one bit for cost. For complete information call a Robertson representative or write to

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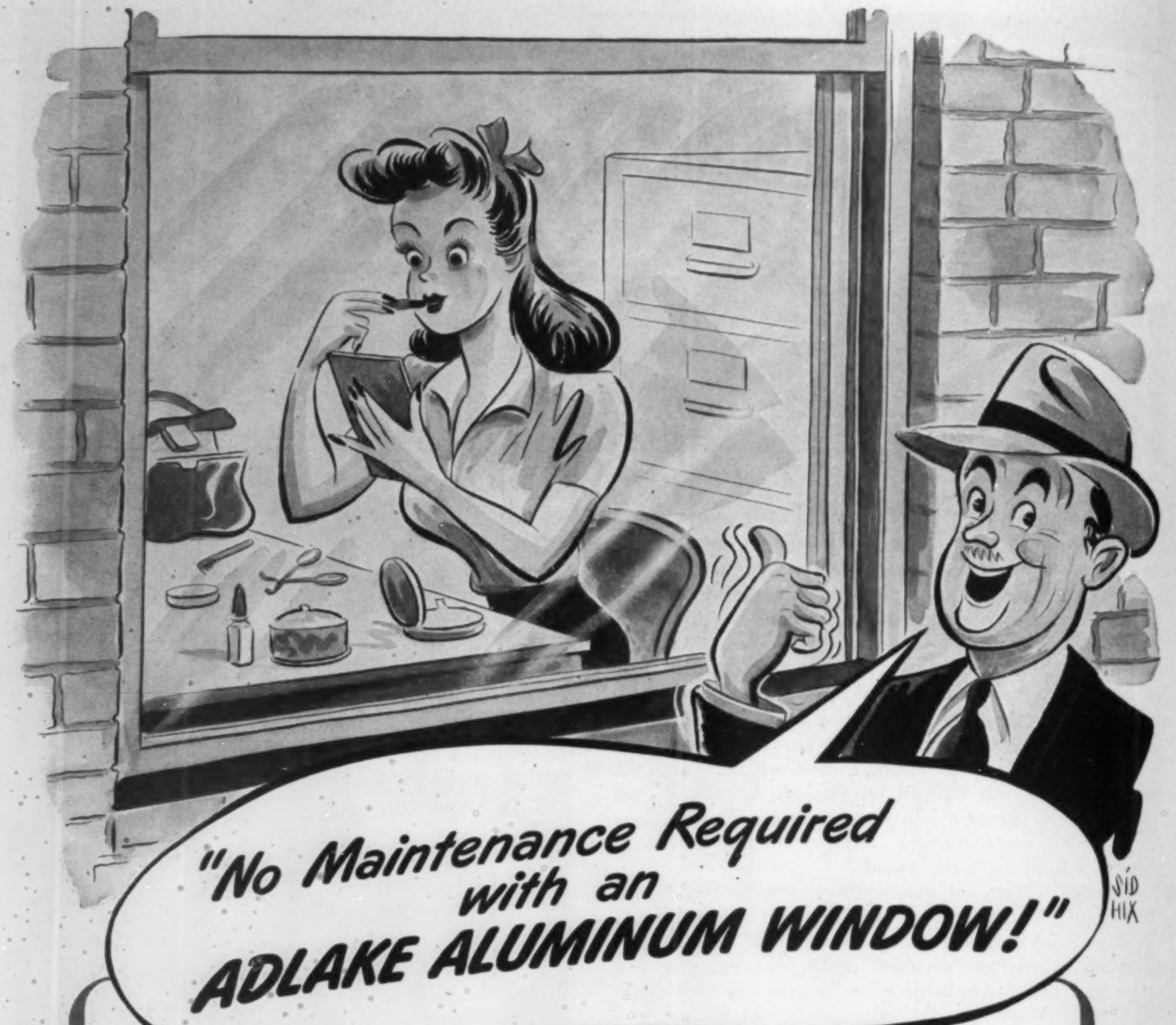
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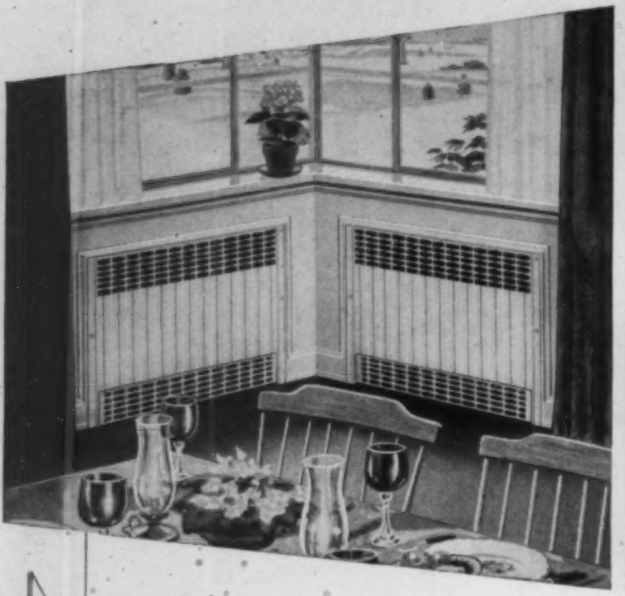

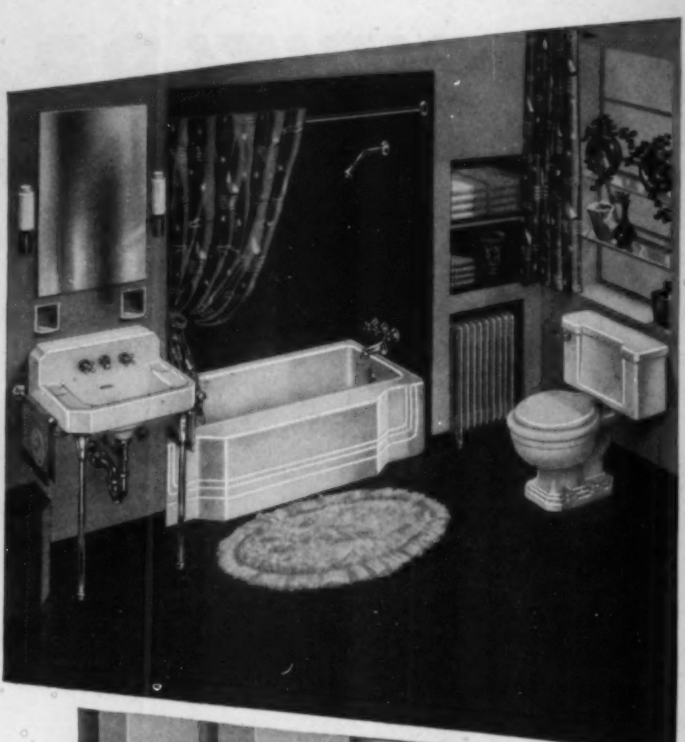

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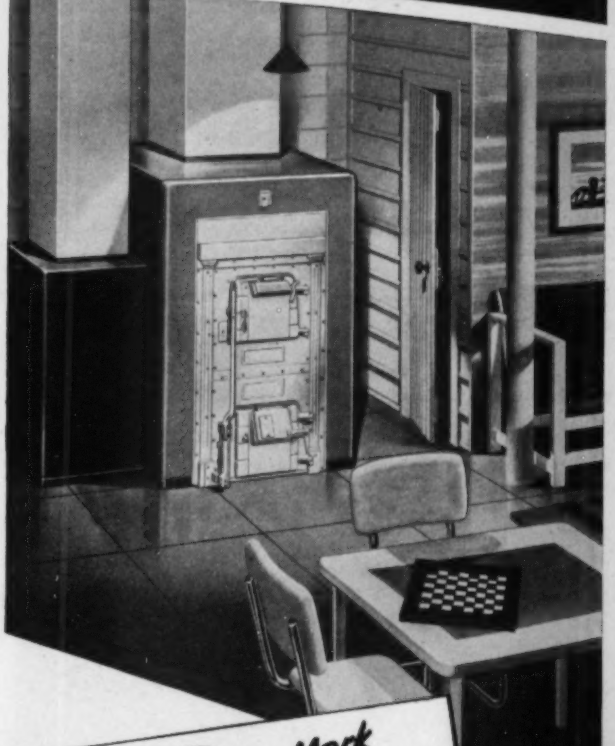

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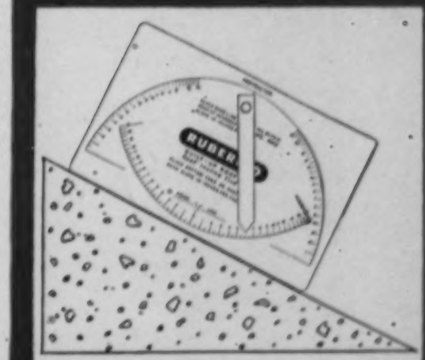

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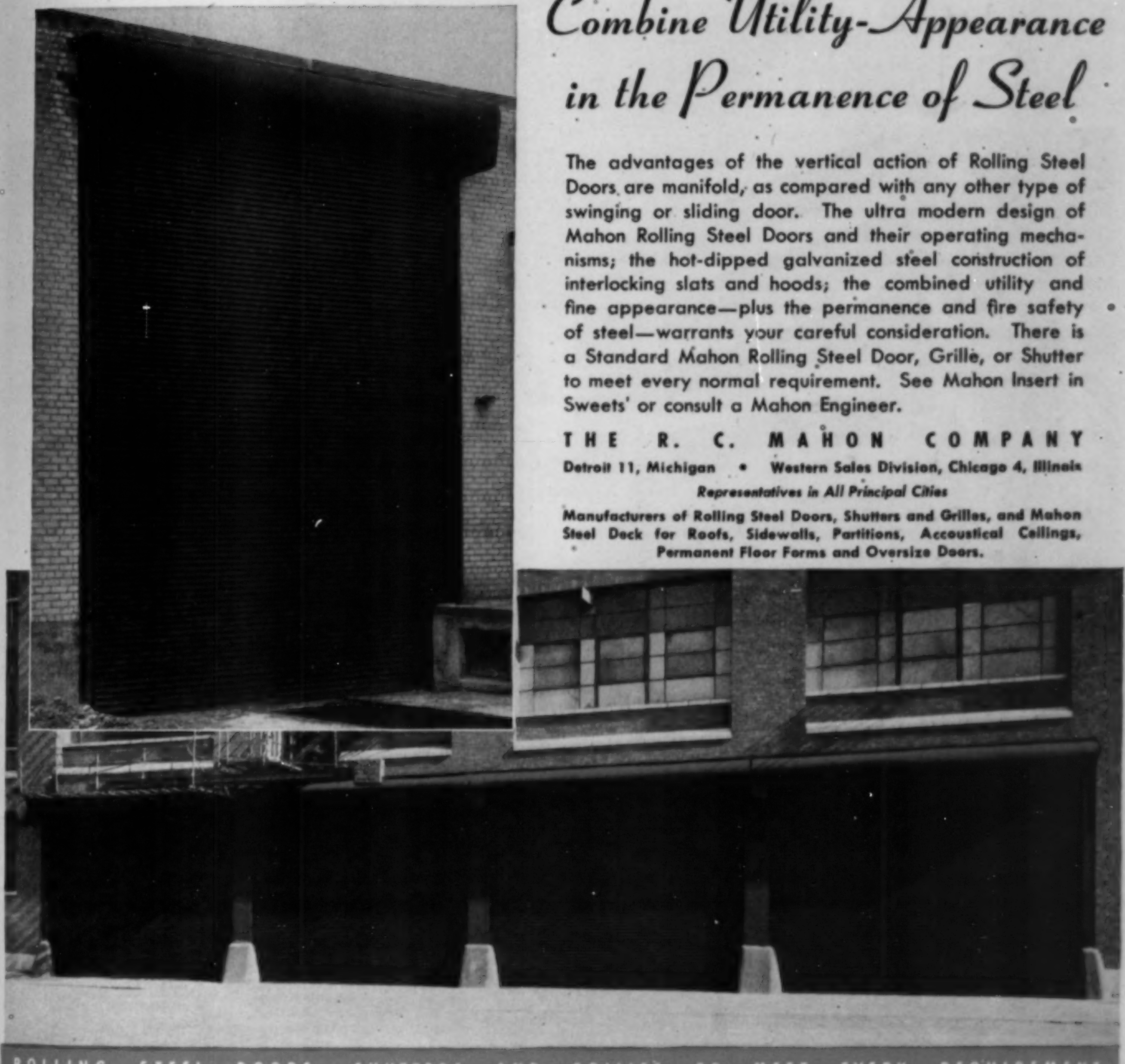

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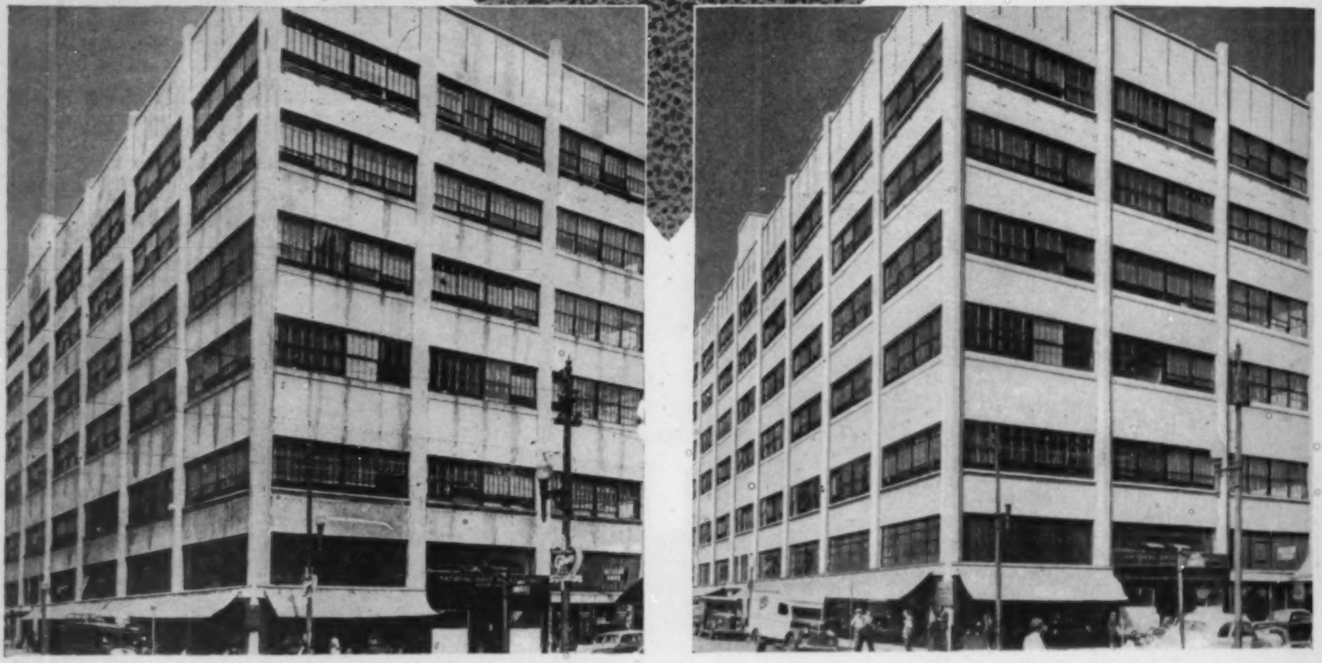

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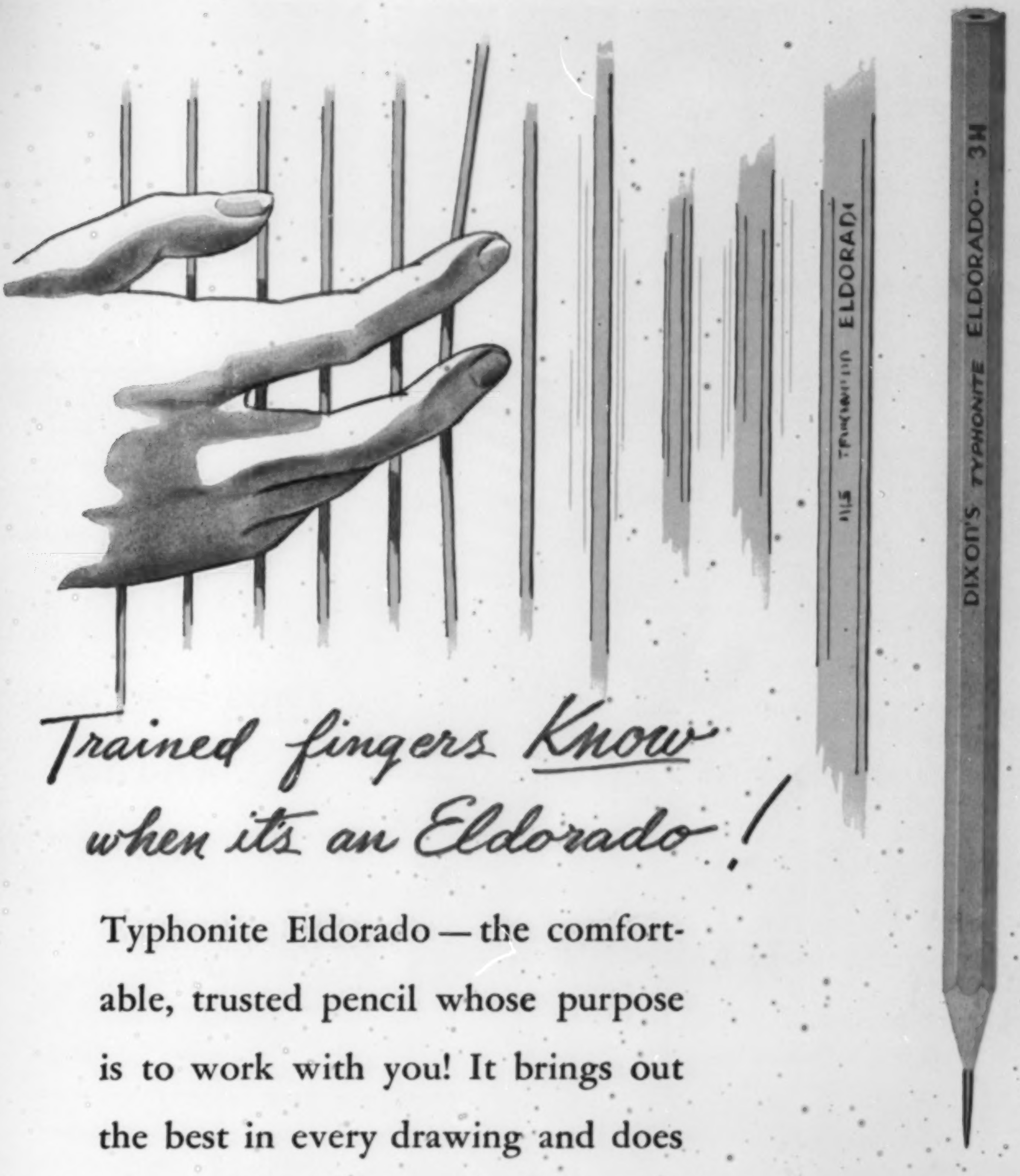
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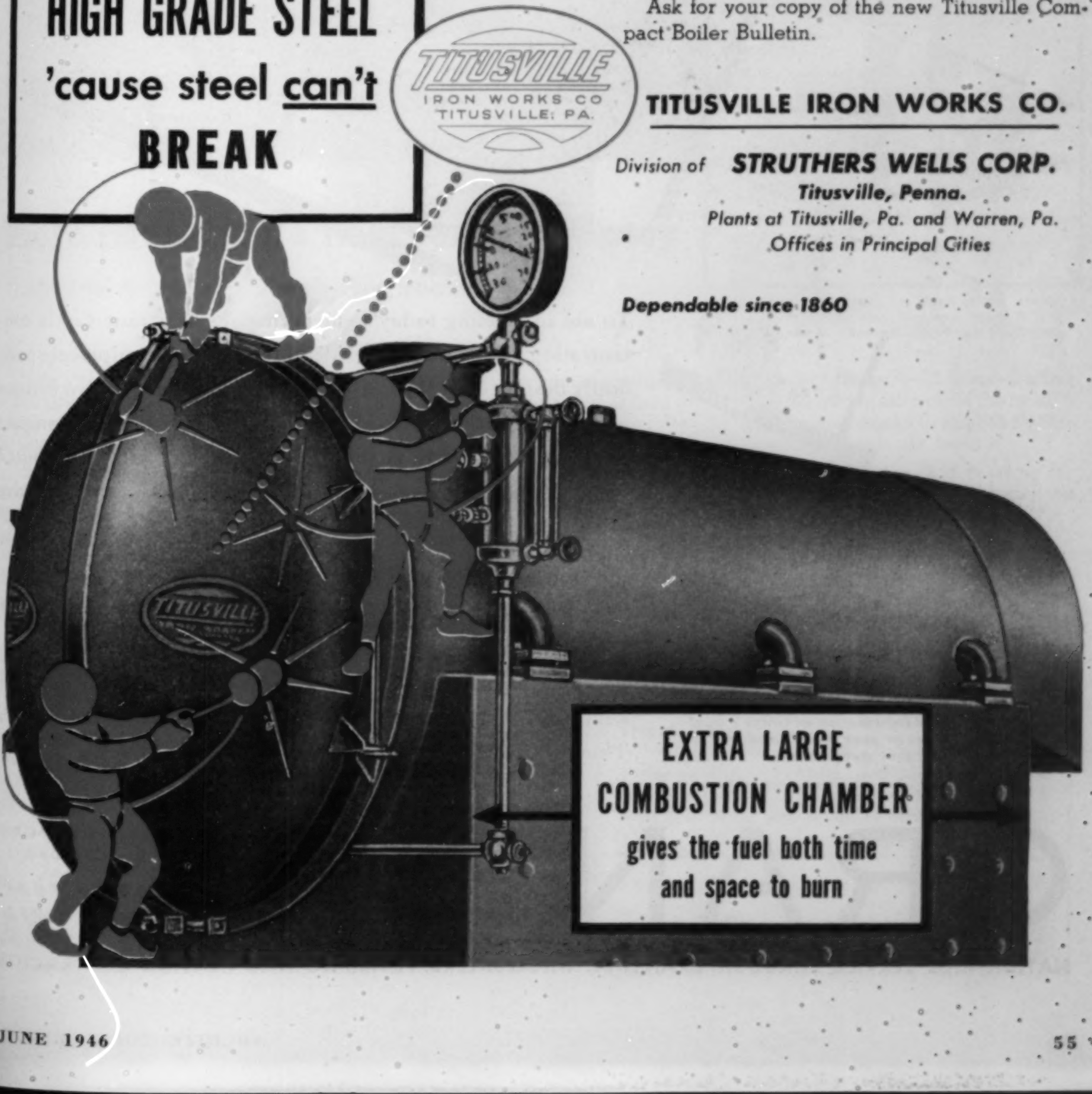
'cause steel can't

BREAK

WHEN the gremlins start working they will find Titusville Compact Boilers a tough nut to crack, for they are truly an "all steel boiler" built to give many, many years of satisfactory, uninterrupted service.

Even the front flue doors are pressed out of steel plate, doing away entirely with shut-downs and expensive repairs so often experienced with other types of flue doors.

Ask for your copy of the new Titusville Compact Boiler Bulletin.



TITUSVILLE IRON WORKS CO.

Division of **STRUTHERS WELLS CORP.**

Titusville, Penna.

Plants at Titusville, Pa. and Warren, Pa.

Offices in Principal Cities

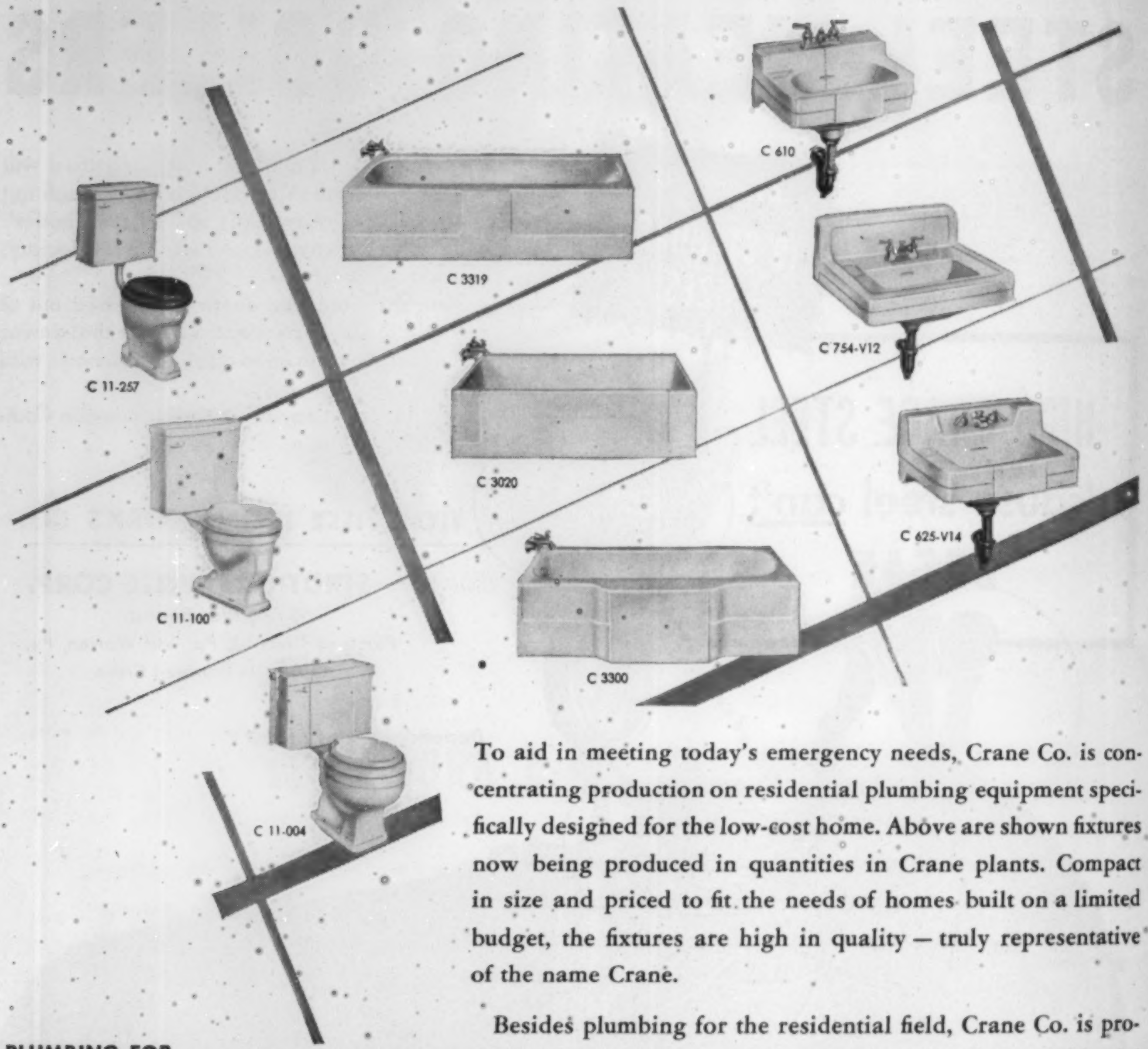
Dependable since 1860

EXTRA LARGE COMBUSTION CHAMBER

gives the fuel both time and space to burn

CRANE CONCENTRATES PRODUCTION

ON PLUMBING FOR TODAY'S ESSENTIAL NEEDS



To aid in meeting today's emergency needs, Crane Co. is concentrating production on residential plumbing equipment specifically designed for the low-cost home. Above are shown fixtures now being produced in quantities in Crane plants. Compact in size and priced to fit the needs of homes built on a limited budget, the fixtures are high in quality — truly representative of the name Crane.

Besides plumbing for the residential field, Crane Co. is producing fixtures to cover the essential needs of non-residential construction.

Whatever plans are on your boards—residential or non-residential — consult your Plumbing Contractor or Crane Branch. They will be glad to assist you in every way possible.

PLUMBING FOR NON-RESIDENTIAL CONSTRUCTION

The non-residential field—hospitals, schools, public buildings and other construction—requires plumbing specifically designed to meet many needs. Crane is producing a complete line of equipment for these fields. Be sure to get information on Crane Plumbing for all the plans on your boards and include Crane Plumbing in your specifications.

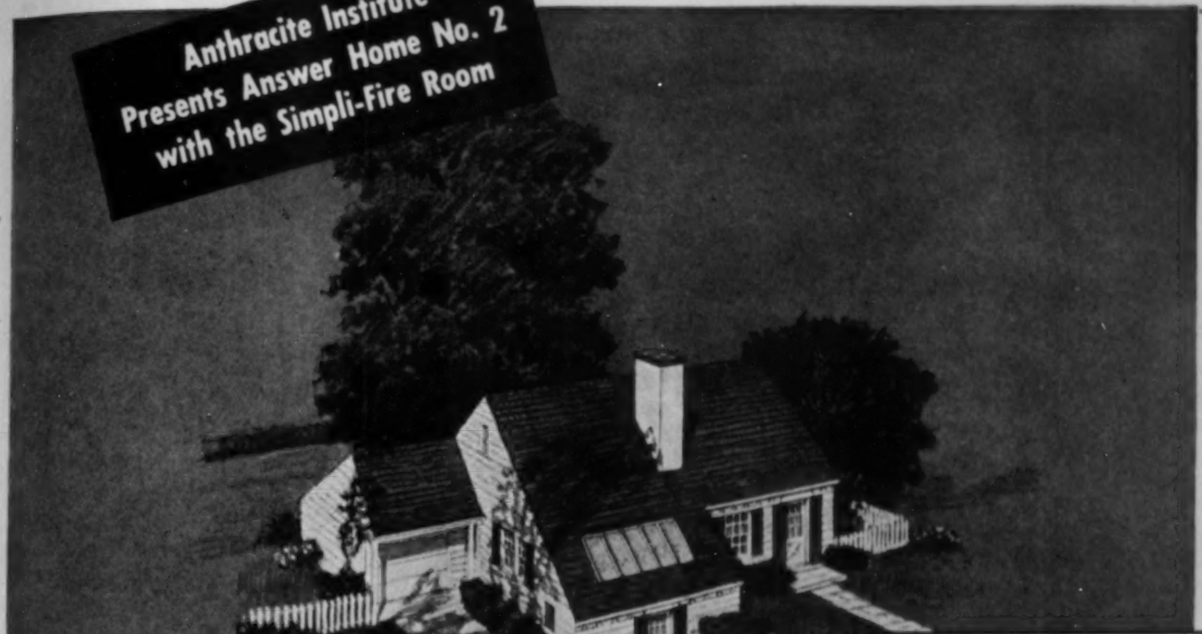
CRANE

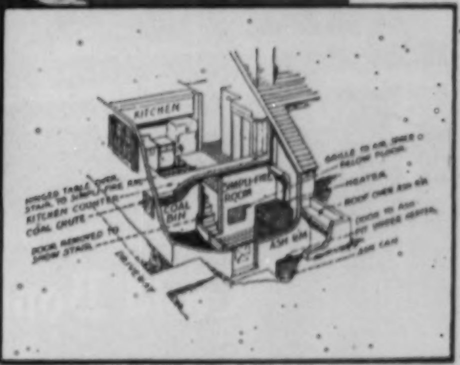
CRANE CO., GENERAL OFFICES:
836 S. MICHIGAN AVE., CHICAGO 5

PLUMBING • HEATING • PUMPS
VALVES • FITTINGS • PIPE

NATION-WIDE SERVICE THROUGH BRANCHES, WHOLESALERS, PLUMBING AND HEATING CONTRACTORS

Anthracite Institute
Presents Answer Home No. 2
with the Simpli-Fire Room




KITCHEN
HINGED TABLE OVER STAIR TO SIMPLI-FIRE RM
KITCHEN COUNTER
COAL CHUTE
DOOR REMOVED TO SHOW STAIR
DRIVEWAY
COAL BIN
SIMPLI-FIRE ROOM
ASH BIN
GRILLE TO AIR SPACE BELOW FLOOR
HEATER
ASH CAN

SIMPLI-FIRE ROOM . . . Heart of the Answer Home. Note its efficiency. See how simple it is to feed the heater . . . how ash shoveling is eliminated.

More House, More Heat for Less Money

thanks to Anthracite Simpli-Fire Room!

TODAY so many prospective home owners are caught between the millstones of rising prices and stationary incomes. How can you help them?

Anthracite Institute tackled this problem with the conviction that heat is a necessity only part of the year; that money could be saved by scientifically engineering both heating room and system; that this money saved could be used to buy more and better house.

The result is the Answer Home with the Simpli-Fire Room, designed by Chapman and Evans, one of the most far-reaching developments in years.

1. Conveniently located, a few steps down from the kitchen, the Simpli-Fire Room eliminates all need for the costly, old-fashioned cellar, saves construction time, reduces over-all cost.

2. Heating costs, too, are lower, since the Simpli-Fire Room is designed for anthracite, the economy quality fuel.

3. Because of the Simpli-Fire Room, the use of anthracite becomes easier than anyone ever thought possible. The storage bin is within easy shovel reach of the heater. Ashes feed by gravity into a light metal basket. This is removed *outside the house*. Thus, ash shoveling becomes a thing of the past—along with the dust and dirt!

4. Type of heating is optional . . . steam, hot water, warm air. Plenty of heat is assured with warm, healthful floors.

Answer Home No. 2 featured above is an interesting example of the modern cottage, and thanks to the Simpli-Fire Room, thousands can build it.

Architects are invited to write for definitive drawings of this house, together with details of co-operation.

For FREE Plans of this Answer Home—and others—mail coupon today.

ANTHRACITE INSTITUTE

Anthracite Institute
Department 69
101 Park Avenue, New York 17, N. Y.

Please send free of charge handsome 16-page color brochure showing Answer Homes Nos. 1, 2 and 3 with floor plans; also details of Simpli-Fire Rooms.

Name______________________________

Firm______________________________

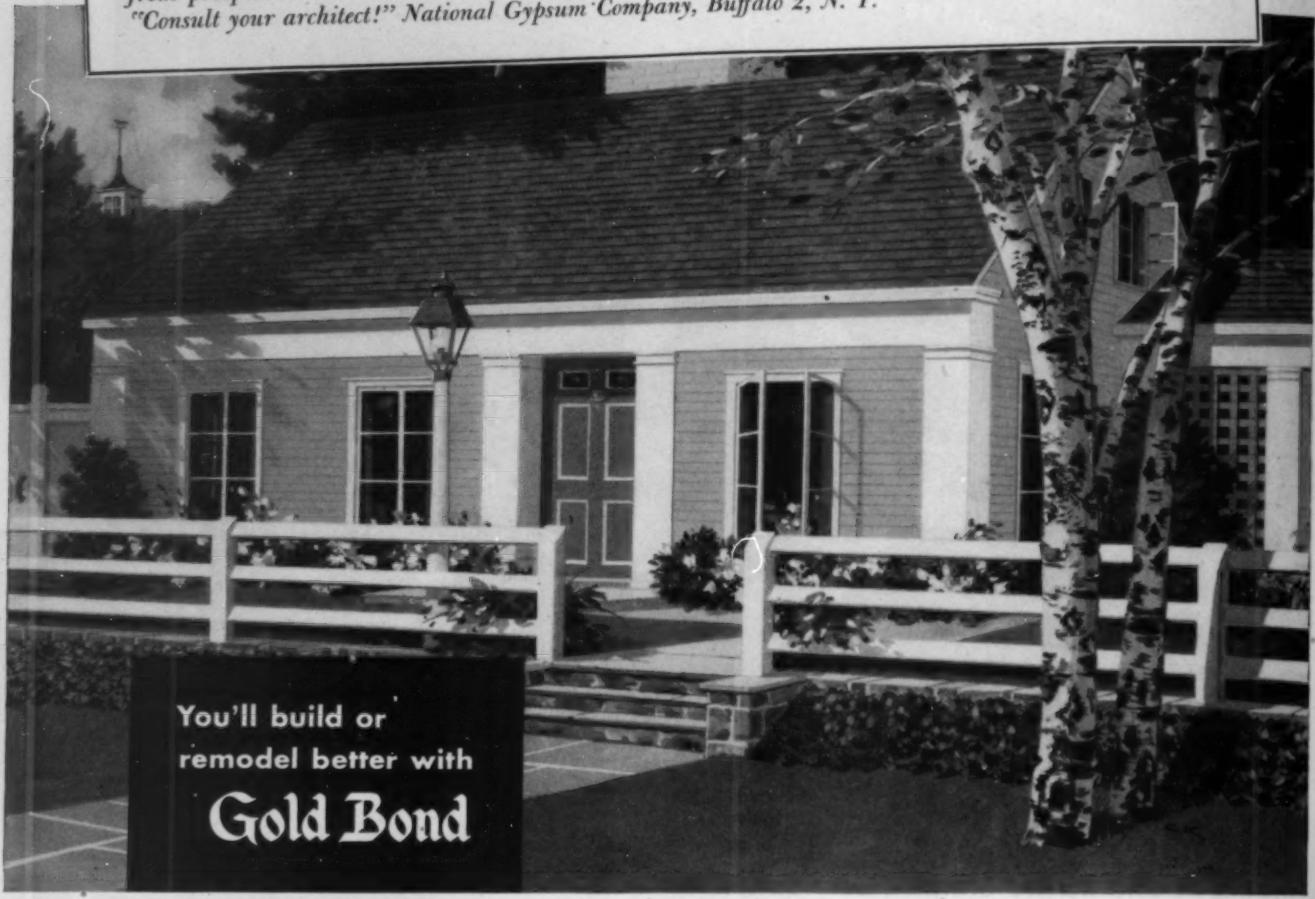
Street_____________________________

City______________Zone____State________

ANTHRACITE INSTITUTE

101 PARK AVENUE, NEW YORK 17, N. Y.

SORRY, NO PLANS AVAILABLE, BUT *. . . Another full color ad in the new Gold Bond series now running in the Saturday Evening Post. Like previous ads, this will probably bring a flood of letters from prospective home builders inquiring, "Where can we obtain the plans?" And the answer will be, "Consult your architect!" National Gypsum Company, Buffalo 2, N. Y.*



Ask your Gold Bond lumber and building material dealer how to have a home like this. He is headquarters for new building products and ideas.

So nice to come home to !

WHEN you swing off the bus at the corner after a hard day's work, think how nice it would be to come home to a new house like this—all your own! That's what a lot of us have been looking forward to for years. Of course, it doesn't have to be this Cape Cod cottage—nice as it is. You might want a "modern" or a colonial type. Or some other traditional style. Whatever the design, it will be your dream home—and you'll love every inch of it!

Few people build more than one home in a lifetime—so it's important to know before you start what to insist on to make your investment a sound one. Take walls and ceilings for instance. It's easy—for a few months or years—to hide cheap, second-rate quality in walls and ceilings. But today, thanks to Gold Bond's years of research, it's just as easy to build walls that will last virtually forever. Firesafe. Ever so much stronger structurally at no extra cost. Walls that turn away summer heat and keep you warmer in winter. That can be decorated in the most charming colors you've ever laid eyes on with a marvelous new paint that dries in one hour.

You can get these advantages and many more by demanding the six Gold Bond features shown below. They are part of the famous Gold Bond family of 152 better building products, produced in 23 modern plants and sold through 10,000 leading lumber and building material dealers.

There's a Gold Bond Dealer in your locality. See him first when you start thinking about new building or modernizing. He can bring you the latest in building products and ideas. He can really make that new home "so nice to come home to" in beauty and value at no more than the cost of ordinary construction. National Gypsum Company, Buffalo 2, N. Y.

Over 150 tested Gold Bond Building Products for new construction or remodeling add greater permanency, beauty and fire protection. These include wallboard, lath, plaster, lime, sheathing, wall paint, insulation, metal and sound control products.

DEMAND THESE SIX GOLD BOND FEATURES IN YOUR NEW HOUSE

GOLD BOND FIREPROOF GYPSUM SHEATHING

Big, weatherproofed panels of Gold Bond Storm Sealed Gypsum Sheathing add structural strength and built-in fire protection. Cost less than old-style sheathing.

GOLD BOND FLOATING WALL SYSTEM

A new way to build plaster interiors with "floating action" to withstand normal structural strain. Longer-lasting beauty. Greater fire protection, less room-to-room noise.

GOLD BOND FIREPROOF GYPSUM LATH

Gold Bond Gypsum lath is the perfect plaster base. Can't warp, expand or contract. Available with insulating vapor-seal, metal back as a barrier to condensation.

GOLD BOND FIREPROOF PLASTER AND LIME

Micron-sized Gold Bond Gypsum Plaster plus specially processed pure white Gold Bond Finish Lime build new beauty and lasting satisfaction into walls and ceilings.

GOLD BOND FIREPROOF ROCK WOOL INSULATION

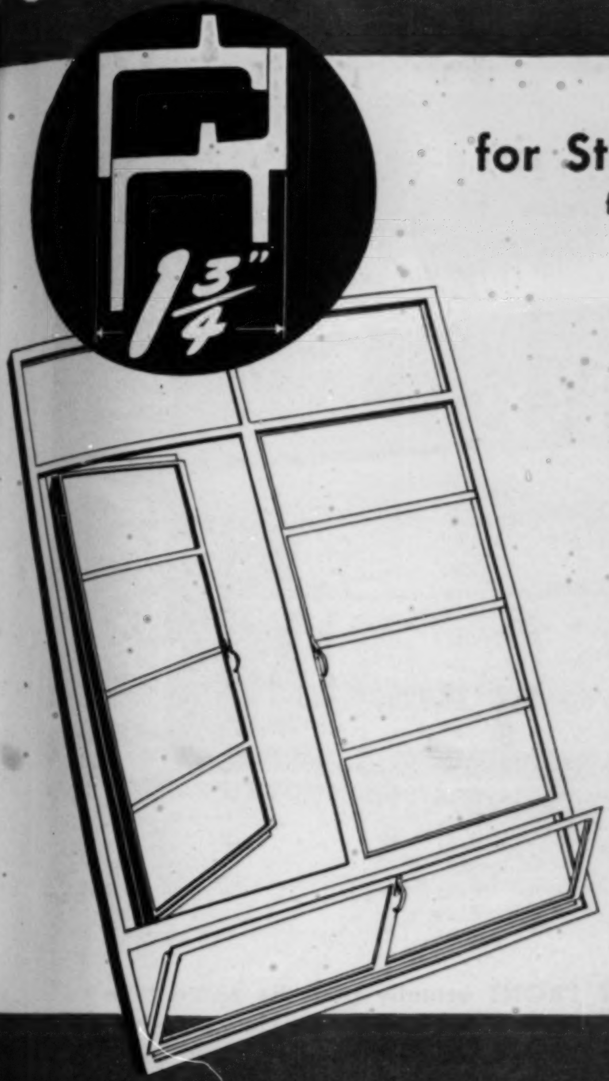
Gold Bond
Gold Bond
Gold Bond

For greater year 'round comfort in new and old homes. New. Extra-efficient. Waterproof. Fireproof. Verminproof Cuts heating costs as much as 30%.

GOLD BOND SUNFLEX 1-HOUR WALL PAINTS

Dries in one hour with no objectional paint after-odor. Easier to apply. This modern decoration is now available at your dealer's in a full range of colorful tones.

NO EXTRA COST

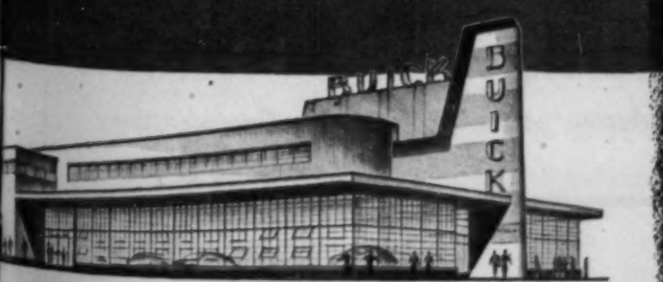


for Stronger Mesker Metal Windows

for Schools, Hospitals, Apartments, Office Buildings

There is no substitute for STRENGTH . . . yet added strength is just one of the many "extras" making Mesker the outstanding metal window in the field. At no extra cost, you get beauty, convenience and utility PLUS the metal mass so essential for durability and long life — a total thickness of 1¾" to the casement! *No other metal window is made to such generous proportions.* Deep ventilator members assure perfect alignment of vents, enhance the weather-tightness of the window. Extra depth of frame bars give greater strength, more resistance to wind pressure. We've built "window satisfaction" into the slim lines of every Mesker Metal Window . . . our engineers have designed them to last as long as the building itself!

MESKER
METAL WINDOWS



DESIGN FOR AN AUTOMOBILE AGENCY—walls of light make a showcase for the 1946 models. Mesker Metal Windows throughout!

MAIL THIS COUPON NOW!

MESKER BROS., Dept. AR66, 428 S. Seventh St., St. Louis 2, Mo.

Without cost or obligation, mail me the following:

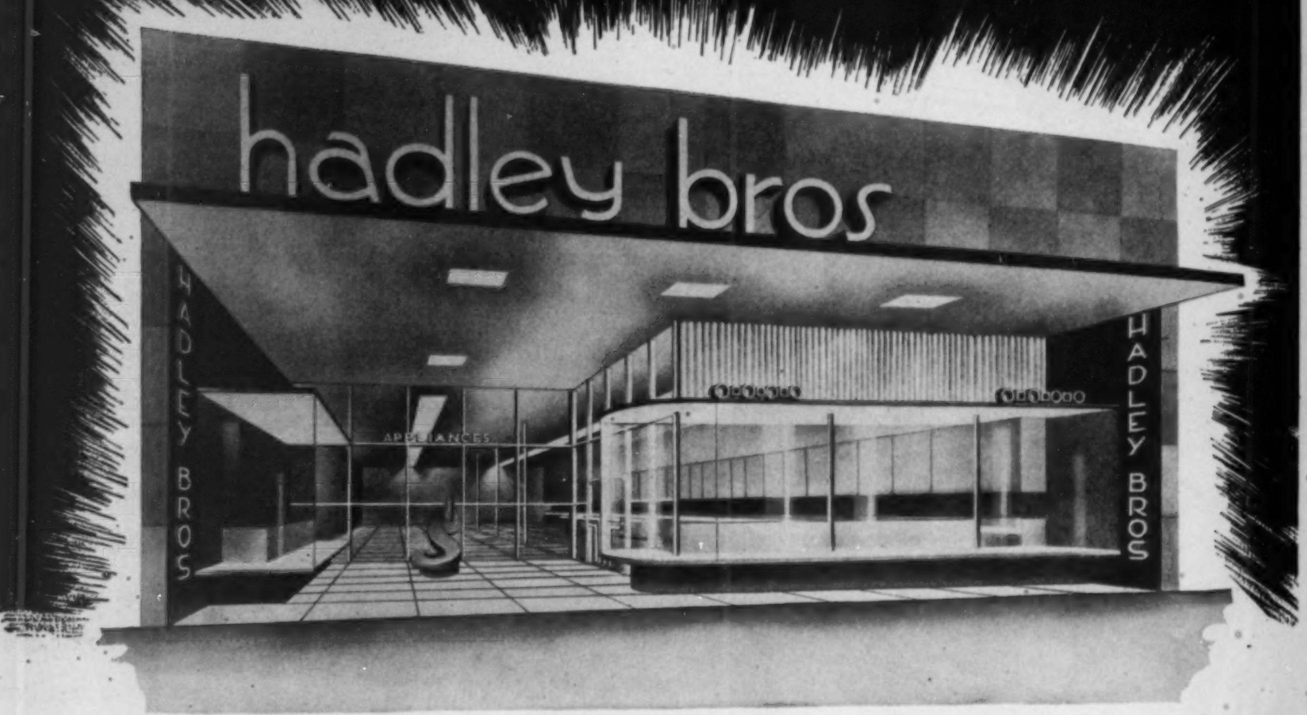
☐ Book of Apartment Windows
☐ Book of School Windows
☐ Book of Hospital Windows
☐ Book of Windows for Homes
☐ Public Building Windows
☐ Office Building Windows
☐ Book of Industrial Windows

Architect ____________________

Address ____________________

City __________ Zone ______ State __________

It's ALL SHOW CASE
.. CLEAR TO THE REAR



Brasco
MODERN STORE FRONTS

THE FRIENDLY FRONT actually puts the entire store on display. Its broad, unobstructed areas of clear glass breathe cordiality and invite immediate inspection of the tempting array of wares revealed within.

The new idea is to plan the front as part of the store itself and you can do this best with complete Brasco Construction. The Brasco line of unified members has been developed and engineered in keeping with the most advanced conception of exterior-interior store front design. All parts are precision machined to fit perfectly and simplify installation problems. Classic beauty of design and finish contribute unobtrusively to the entire architectural scheme.

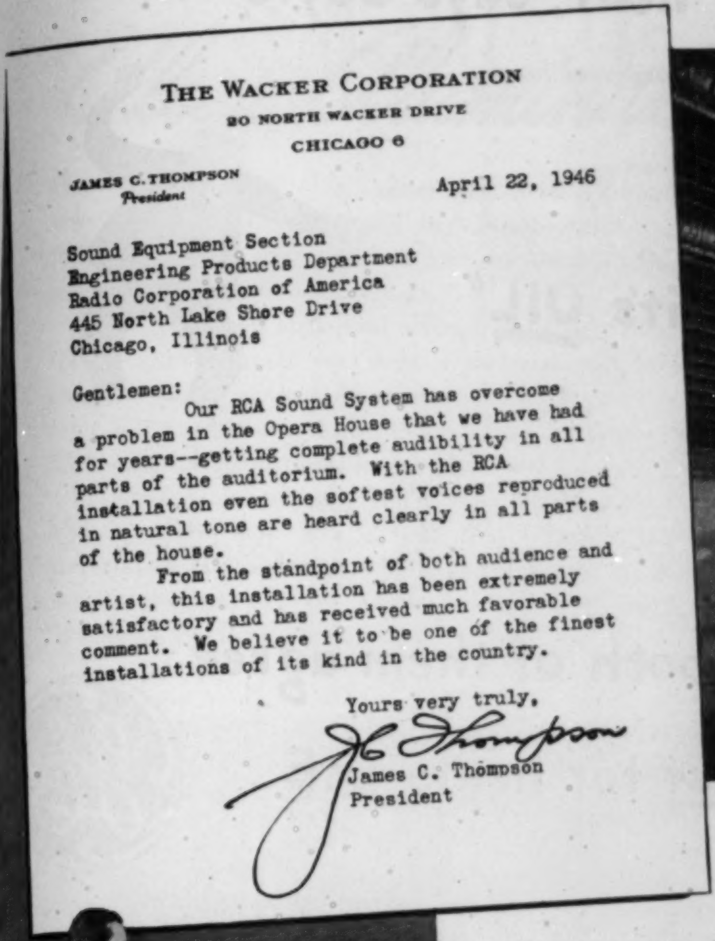
Brasco Store Fronts are built to endure. Heavy-gauged members, in all modern metals, are steel reinforced where additional strength is required. Exclusive patented features are incorporated for adequate glass protection. Thus, Brasco not only builds beautiful fronts . . . . it *safeguards* that beauty for a lifetime of service.

A Complete Line for Every Design

BRASCO MANUFACTURING CO.
HARVEY · (Chicago Suburb) · ILLINOIS

National Distribution Assures Effective Installation

RCA Sound System solves 16-year-old problem of CHICAGO CIVIC OPERA HOUSE



THE WACKER CORPORATION
20 NORTH WACKER DRIVE
CHICAGO 6

JAMES C. THOMPSON
President

April 22, 1946

Sound Equipment Section
Engineering Products Department
Radio Corporation of America
445 North Lake Shore Drive
Chicago, Illinois

Gentlemen:

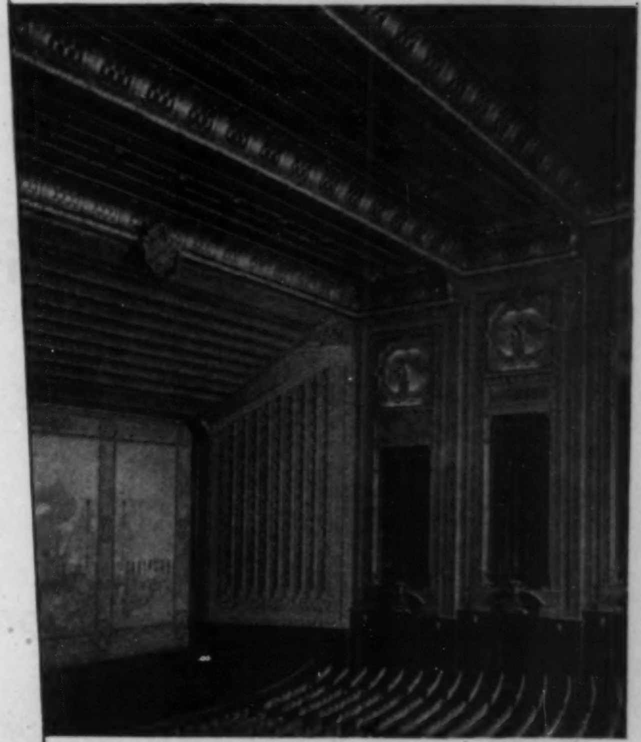
Our RCA Sound System has overcome a problem in the Opera House that we have had for years--getting complete audibility in all parts of the auditorium. With the RCA installation even the softest voices reproduced in natural tone are heard clearly in all parts of the house.

From the standpoint of both audience and artist, this installation has been extremely satisfactory and has received much favorable comment. We believe it to be one of the finest installations of its kind in the country.

Yours very truly,

J C Thompson

James C. Thompson
President



View of Chicago Civic Opera House, completed in 1929 with a seating capacity of 3,517. RCA Sound System speakers are strategically located for complete audience coverage.

RCA Control Console located at side of balcony provides simultaneous, individual control of twelve stage microphones and auditorium volume level.

THIS outstanding RCA Sound System installation provides twenty-one stage microphone positions, any twelve of which may be used simultaneously. Position of the control console in the auditorium balcony permits selection of best operating level for each individual stage microphone and optimum over-all volume level from the standpoint of the listening audience.

Here is another excellent example of RCA Sound System engineering . . . and another excellent reason to come to RCA for the finest in sound equipment. For full information see your local RCA Sound Distributor, or write direct to Sound Equipment Section, Dept. 10-F, Radio Corporation of America, Camden, N. J.

SOUND SYSTEMS

RADIO CORPORATION of AMERICA

ENGINEERING PRODUCTS DEPARTMENT, CAMDEN, N.J.

"It's GAS for heat," says Doyle

"Oh no", says Brown, "it's OIL"

...yet both of them agree

the best for heat's G.E.

WHETHER your client is Brown or Doyle, you can go along with his heating preferences *and still specify G. E.*

There are G-E gas- or oil-fired units for your steam, hot water or conditioned warm air applications. Each of these is time-tested, reliable . . . worthy of the G-E reputation . . . and *yours!*

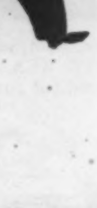
Remember, too, that a G-E unit will please your client because of its economical operation. Some G. E. owners have reported savings up to ½ their fuel bill.

So, for the kind of home-planning clients tell their friends about, be sure to include a G-E unit in your specifications. See Sweets Catalog for details. For information on price and delivery call your nearest G-E dealer—you'll find him listed in your Classified Telephone Directory. *General Electric Co., Air Conditioning Department, Section 6446, Bloomfield, N. J.*

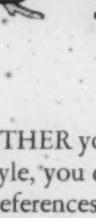
Automatic Home Heating

GENERAL ELECTRIC

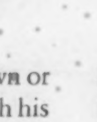
OIL-FIRED



Boiler for steam or hot water heating systems

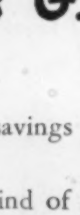


G-E Winter Air Conditioner (warm air)

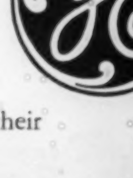


G-E Conversion Oil Burner

GAS-FIRED



Boiler for steam or hot water heating systems



G-E Winter Air Conditioner (warm air)

FOR INSIDE AND OUT YOU CAN SPECIFY...

Alcoa Aluminum

One of the outstanding advantages of Alcoa Aluminum as a building material is the fact that it is not limited to either inside or outside use. You can gain by using it for both interior *and* exterior applications.

Where you need structural strength and light weight—specify aluminum. If you need a material with weather resistant quality—Alcoa Aluminum has it. It can't rust—can't rot—can't warp. And for decorative purposes, Alcoa Aluminum has almost limitless applications.

Yes, inside and outside, you'll build better with Alcoa Aluminum. Be sure you include this versatile building material in the plans on which you are now working. ALUMINUM COMPANY OF AMERICA, 1867 Gulf Building, Pittsburgh 19, Pennsylvania.

Faced entirely of Alcoa Aluminum sheet this building is tangible evidence of the trend to aluminum for building construction.

Where protection and appearance go hand in hand, as in these bank grilles, it's a job for aluminum.

Here is structural strength combined with lightweight - - a job for which Alcoa Aluminum is ideally fitted.

Utility and beauty are combined in aluminum guardrails. With little maintenance, these will keep their attractive appearance for years.

Aluminum skylights provide excellent weather resistant qualities and reduce maintenance. They can't rust - - can't rot.

THE MOST VERSATILE OF ALL BUILDING MATERIALS

Lighting Fixtures
Revolving Doors
Lockers
Roofing
Elevator Doors
Office Partitions
Ventilators
Venetian Blinds
Windows
Grilles
Screening

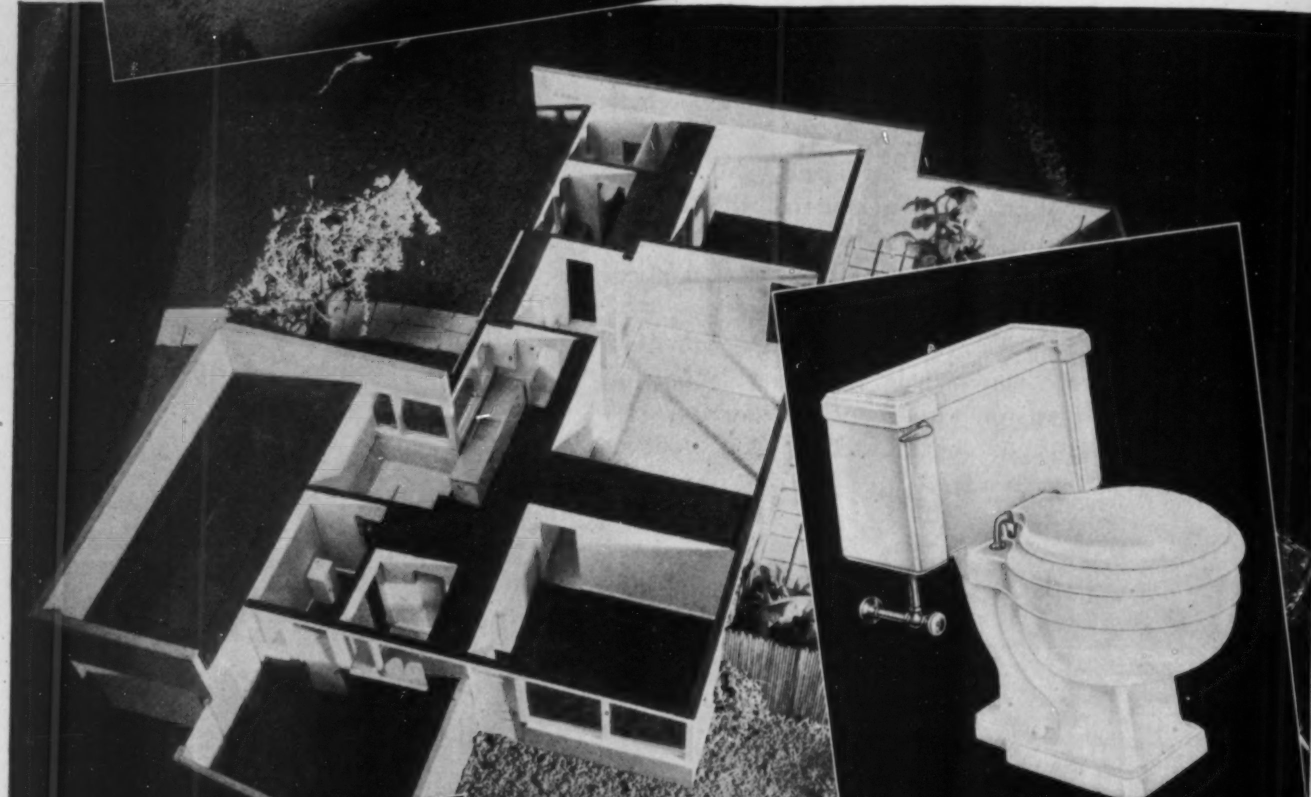
ALCOA FIRST IN **ALUMINUM**

REG. T. M.

ALCOA
ALUMINUM

C S h #11
Case Study House

the "GI" model



Sponsored by ARTS & ARCHITECTURE *Magazine*
J. R. DAVIDSON, *Architect*

WITH Case PLUMBING FIXTURES

Planned to satisfy high standards of convenience and comfort without exceeding the limits of "G I" budgets, this house is designed with two efficient bathrooms. The Case plumbing fixtures were selected by the architect to meet both requirements in full. Their design, *vitreous china* construction and mechanical excellence assure lifetime satisfaction and freedom from costly maintenance. Case plumbing fixtures are distributed nationally—see your Classified Telephone Directory or write W. A. Case & Son Mfg. Co., Buffalo 3, N. Y. Founded 1853.

THE LAVATORY is the ever-popular *Cosmette* with concealed front overflow, anti-splash rim, chrome finish accessories and convenient shelf. Available also in wall-hung style.

★

THE WATER CLOSET is the 2-piece combination *DeLuxe* model, with modern styling and a silencing device that assures quietness under all pressures. Free-standing tank does not deface the wall.

Douglas Fir Plywood Again Allocated

-To Meet the Urgent Needs of the Reconversion Housing Program

TODAY'S most urgent and immediate need is for housing—and the Douglas fir plywood industry pledges complete cooperation with the Reconversion Housing Program.

The demand for housing requires that Douglas fir plywood again be put on an allocation basis. This means that a substantial proportion of the industry's production will be channelled to housing contractors, stock cabinet manufacturers, prefabricators and distributors.

As a result, the present supply situation for all other industrial and construction uses will be temporarily aggravated.

May we strongly urge you to anticipate your needs *far in advance*—and discuss your requirements with your regular sources of supply.

Even though today the supply situation in Douglas fir plywood is critically short, for many projects such as forming concrete surfaces, for signs and display work, for boat building, and for many other industrial and commercial uses, it is almost indispensable. In these cases it is well worth waiting for, as it will save time and labor and do a better job.

DOUGLAS FIR
PLYWOOD
LARGE, LIGHT, STRONG,
Real Wood
PANELS

Douglas Fir Plywood Association
Tacoma 2, Washington

COMMERCIAL SOLVENTS CORPORATION, penicillin plant, Terre Haute, Indiana. Diffused natural daylight floods areas where laboratory workers conduct experiments with white rabbits. Insulux has high insulating properties which reduce cost of air conditioning and heating.

SPERRY GYROSCOPE COMPANY, precision manufacturing, Long Island, New York. Insulux panels bring light to stairways and other dark corners in factories or homes. Insulux transmits and diffuses light better than ordinary windows.

Insulux Glass Block is a functional building material—not merely a decoration. It is designed to do certain things that other building materials cannot do. Investigate!

Controlled Daylight

. . . and more . . . with Insulux

ARCHITECTS are making increased use of Insulux Glass Block because it is a functional building material with unique characteristics and because it adds to the appearance of most buildings.

Panels of Insulux transmit and diffuse natural daylight better than ordinary windows. Besides *controlling* light they seal out dirt and dust—insure privacy. High insulating value reduces the cost of heating and air conditioning.

Insulux resists vapor and fumes—painting is not required. It is easy to clean and keep clean.

In laboratories, factories, public buildings, stores, theaters, offices and homes if there is a problem in light control there is usually a spot for the advantageous use of Insulux Glass Block.

Investigate the almost unlimited architectural possibilities of this modern building material.

5 REASONS WHY

1. **SAVE FUEL**—Better insulation means less fuel loss.
2. **SAVE UPKEEP CHARGES**—Easy to clean—and to keep clean. No painting required.
3. **SAVE MAN HOURS**—Better light control insures better working conditions.
4. **SAVE SPOILAGE LOSSES**—No infiltration of dust or dirt.
5. **SAVE REPLACEMENT COSTS**—Panels of Insulux do not rot, rust or corrode.

OWENS - ILLINOIS

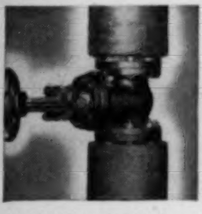
INSULUX

GLASS BLOCK

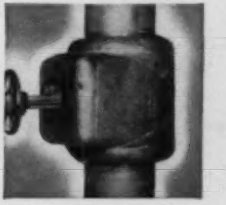
For technical data, specifications, and installation details, see our section in Sweet's Architectural Catalog, or write: Dept. C-6, Owens-Illinois Glass Co., Toledo 1, Ohio.

Here's how to "dress up" exposed cold lines

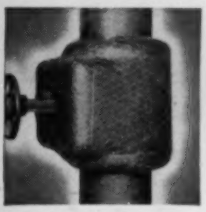
These pictures show the application of Armstrong's Cork Covering to a fitting where both efficient insulation and maximum attractiveness are wanted. Although covering often must be thick to help maintain low temperatures, it need not look clumsy and conspicuous. It can be streamlined, with a surface that's easy to clean.



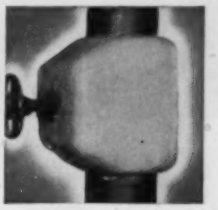
1. Cork covering on cold line ready for final finish; valve still uninsulated.



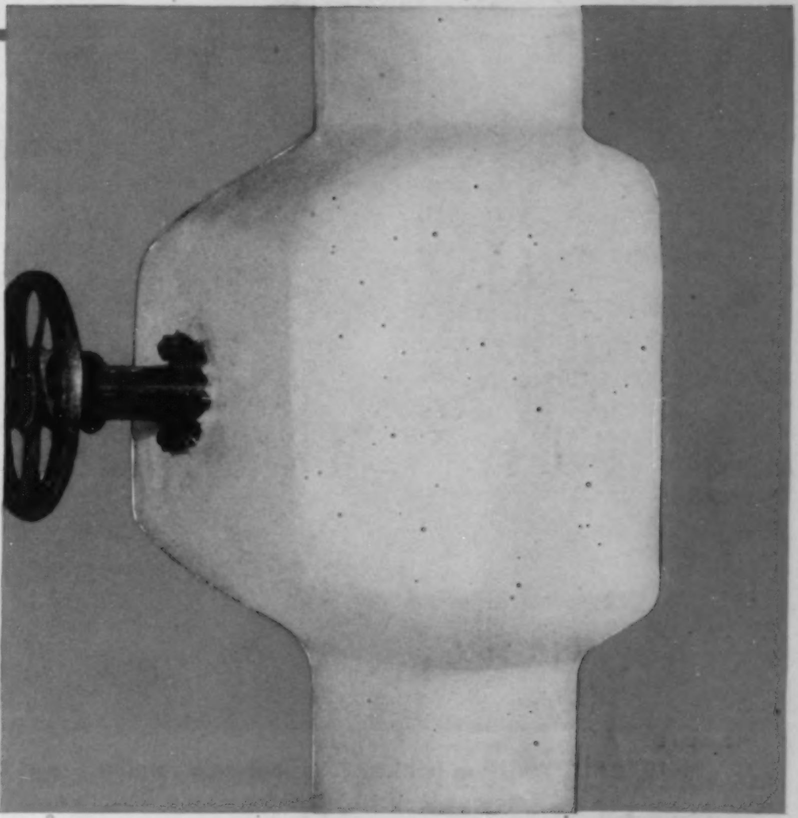
2. Sections of Armstrong's Fitting Cover cemented together and wired on.



3. Hexagonal mesh wire stapled over fitting cover to provide key for cement.



4. Asbestos and portland cement mixture troweled on in two coats.



5. Final finish on low-temperature valve and line is 8-oz. canvas, sewed on, sized and painted with two coats of good quality oil paint in desired color. (Steps not shown here: all joints are sealed with Armstrong's Seam Filler, and interior voids are poured with Armstrong's Fitting Filler.)

COLD LINE INSULATION must always be efficient—but in many applications a smooth, clean looking appearance is a further asset. In buildings where cold lines are exposed, the application of this finish can contribute greatly to orderly and sanitary appearance.

Straight sections of covering are finished in the same manner as fitting covers, except that instead of the addition of hexagonal mesh wire and cement, rosin sized paper is wrapped around the cork covering before application of the sewed canvas and paint finish.

For further information on Armstrong's Cork Covering and other low-temperature insulations, write today to Armstrong Cork Co., Building Materials Division, 2406 Concord Street, Lancaster, Pa.

ARMSTRONG'S INDUSTRIAL INSULATION
Complete Contract Service
For All Temperatures
From 300° Below Zero
To 2600° Fahrenheit

GOOD WASHROOMS | one of the "Big 4" in good working conditions

...say men and women workers in 400 plants

ISABEL: "You can tell how considerate a company is of its employees just by looking at the washrooms."

GRACE: "Can't you though! They must really want us to be happy here—they keep this one so clean and pleasant."

SANITARY modern washrooms mean a whole lot to women workers . . . and men workers too. An unbiased survey of men and women workers from coast to coast shows that these factors are the "Big 4" in good working conditions: good washrooms, proper lighting, safety devices and adequate ventilation.

Besides helping keep workers happy, plenty of hot water, soap and good quality individual paper towels help keep germs from spreading. By encouraging frequent and thorough washing, good washrooms help reduce the number of absences due to colds and their more serious complications.

Haven't you yourself been irritated by a poorly planned, badly equipped washroom? Then make sure your washrooms are designed to be "Health Zones," not "Germ Exchanges"—"morale-boosters," not "temper-testers."

Good Washrooms begin at the Drawing Board

Efficient, well-equipped washrooms that help keep workers healthy and happy are a result of careful thinking and planning in the blueprint stage. For practical suggestions on modern washroom layout, turn to our four pages in Sweet's catalog—or call on the Scott Washroom Advisory Service, Scott Paper Company, Chester, Pennsylvania.

SCOTTISSUE TOWELS
STAY TOUGH WHEN WET

Thirsty Fibre
REG. U. S. PAT. OFF.

Trade Marks "ScotTissue," "Washroom Advisory Service" Reg. U.S. Pat. Off.

LIGHT MODERNIZATION at its *Finest*

with Pittsburgh Permaflector

LIGHTING EQUIPMENT

"Something Better Has Come to Light!"

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NOW! Apartment Dwellers Can Enjoy Individual Comfort

YOU WON'T have to wait until new apartments are built to enjoy just the comfort temperature you prefer. For Minneapolis-Honeywell has developed a "Personalized" Heating Control System that can be installed in your present apartment. With a thermostat in every suite, you can select your own temperature just as you select your decorations. P. H. C. makes available to every apartment dweller the same unlimited comfort that Moduflow* brings to single-family dwellings.

BUILDING OWNERS AND MANAGERS

Now you can install a P. H. C. System in your existing building without remodeling or even redecorating! By an ingenious method developed and used exclusively by Minneapolis-Honeywell, the work can be done in a matter of hours, without inconvenience to your tenants. See below how easily and inexpensively this can be done.

During the past 18 months, Honeywell P. H. C. Systems have been installed in 232 buildings (3,099 suites) in 28 different cities. They are not only greatly increasing tenant satisfaction (which means longer leases) but they are also saving fuel at an average rate of 20 per cent.

* Moduflow is the name given to Honeywell's newest heating control system for homes. It means heat *modulated* to whatever temperature is required for comfort, with a uniform, continuous *flow*.

COMFORT UNLIMITED

Each tenant can have the comfort temperature he desires. Just set the thermostat — as simple as dialing in your favorite radio station.

CUTTING THE GROOVE

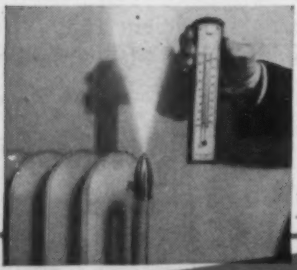
Special cutting tool, designed by Honeywell, cuts groove in wall to conceal wiring. Vacuum cleaner attachment removes plaster chips and dust.

NO "MOVING DAY"

You won't have to face the terrors of moving day in order to enjoy the even, comfortable temperature that only apartments equipped with P. H. C. can offer.

COVERING HIS TRACKS

The flexible copper tubing is sealed in the groove with a specially prepared plastic cement. Then the groove is concealed with adhesive tape previously prepared to exactly match the wall color.

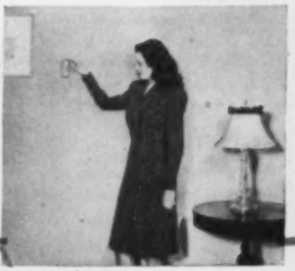


NO UNHEALTHFUL OVERHEATING

No more colds and sickness caused by overheated apartments or drafts from windows opened to get relief. And, precious fuel is saved for other useful purposes.

JOB FINISHED

Within an hour after he started, the service man has departed, leaving behind no mess or evidence of his work. Just as simple as installing a telephone.



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Honeywell
Personalized
HEATING CONTROL

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Please send information about M-H Personalized Heating Control for:
Existing Buildings........ New Buildings........
Name........
Street Address........
City........ State........
Owner ☐ Manager ☐ Architect ☐ Engineer ☐

ARCHITECTURAL

RECORD

WHAT ARE ESSENTIAL BUILDINGS?

AND HOW can we get them built? Most kinds of buildings are considered essential by their particular protagonists, and with logical justification. But when materials and manpower are short, some types of buildings can be deferred more easily than others if the welfare of the nation is the criterion. The Wyatt program puts all emphasis on low-cost housing for veterans. The public would certainly include schools and hospitals high on the list of the essential and non-postponable buildings. We agree.

Now that the first fanfare of the ambitious publicity drive has announced the stage set, the realities of the situation are being appraised by the clear-headed, both in government and out. There is a growing awareness that homes for veterans at rents or prices within reason will be attainable only when three conditions exist:

First, when price adjustments encourage full production of scarce building materials, and competition is again a factor in building supplies.

Second, when the building of *all* types of dwellings (except the luxury class) is again permitted; i.e., the building of both low and moderate-cost dwellings — multi-family, row, or single family — for rent as well as for sale. The *total* supply must be increased. Moderate-cost dwellings and fireproof apartments will add new units that will release lower-cost units, for in the final analysis everyone lives in a "second-hand" home, veterans and civilians alike.

Third, when rental housing entrepreneurs, insurance companies and the like can be assured of a fair return on their investments, rent ceilings realistically related to production, operation and other costs.

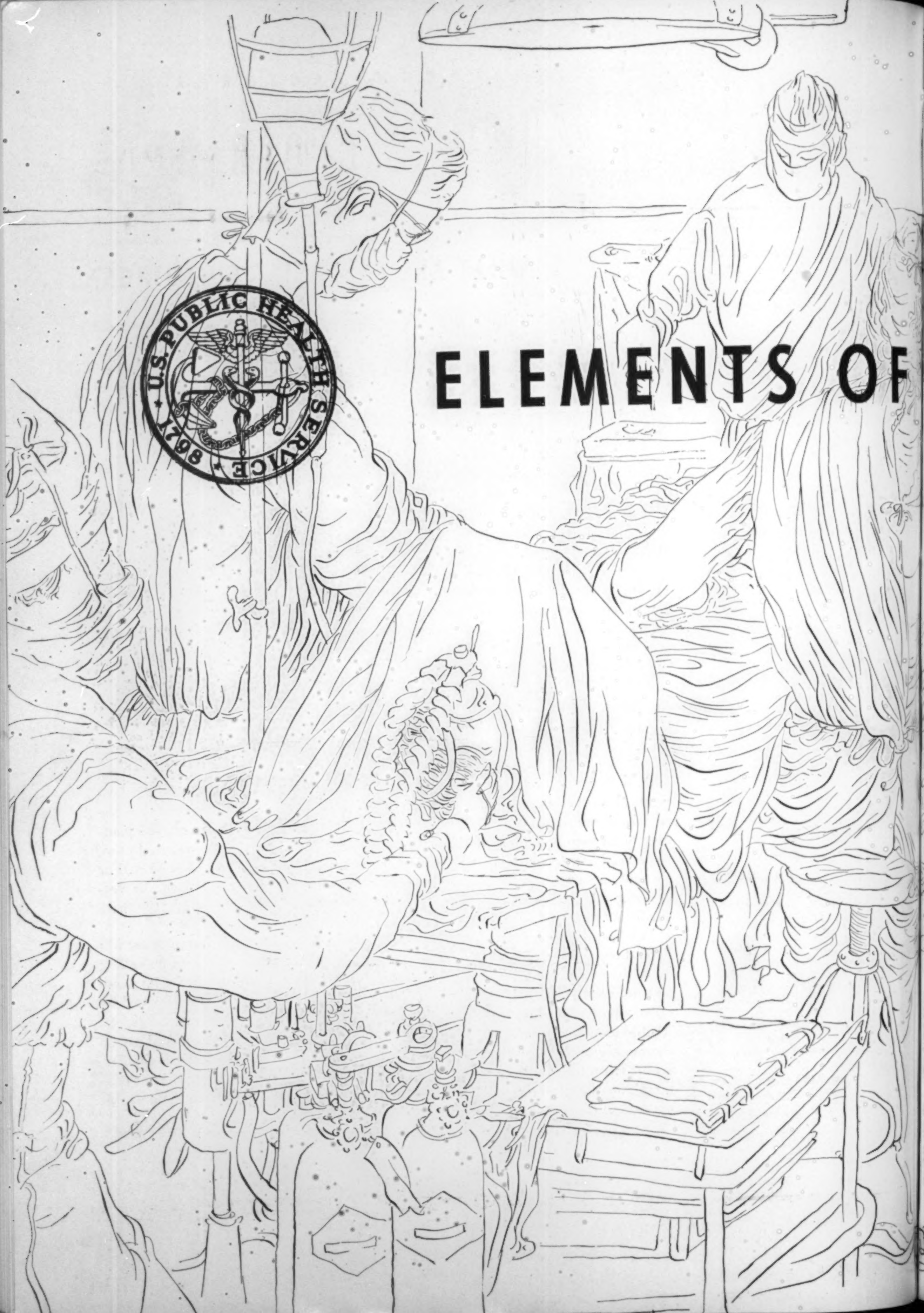
It should go without saying that the *production of materials* is the prime requisite, and Wilson Wyatt has the power to speed production by making it profitable for the manufacturers to produce. Then, and only then, can housing and schools and hospitals and other *essential* buildings get under way in the volume necessary for the welfare of the country, as well as for the welfare of the building industry. The planning of all such buildings should continue in architects' offices at an unabated pace, to be ready when materials and equipment again are flowing into the market. For certainly no agency given the responsibility for the production of homes, for veterans or other civilians, can fail to see the obvious necessity of fulfilling the three conditions stated.

The hospital is one of the essential building types and hospitals for veterans will undoubtedly have preferences. The Veterans' Administration will soon be calling upon the architectural profession to plan the permanent hospitals for its immense and necessary program. It is indicated that architects in private practice will be called upon to do this work at top speed under lump-sum professional contracts. Requirements and standards will soon be worked out. The standards worked out so thoroughly and efficiently by the U. S. Public Health Service (Marshall Shaffer, Senior Hospital Architect) should prove invaluable to architects engaged in or contemplating hospital planning. We are happy to be privileged to publish them at this opportune time. Hospitals too are essential buildings.

Kenneth K. Stowell
EDITOR

ELEMENTS OF

U.S. PUBLIC HEALTH SERVICE 1798

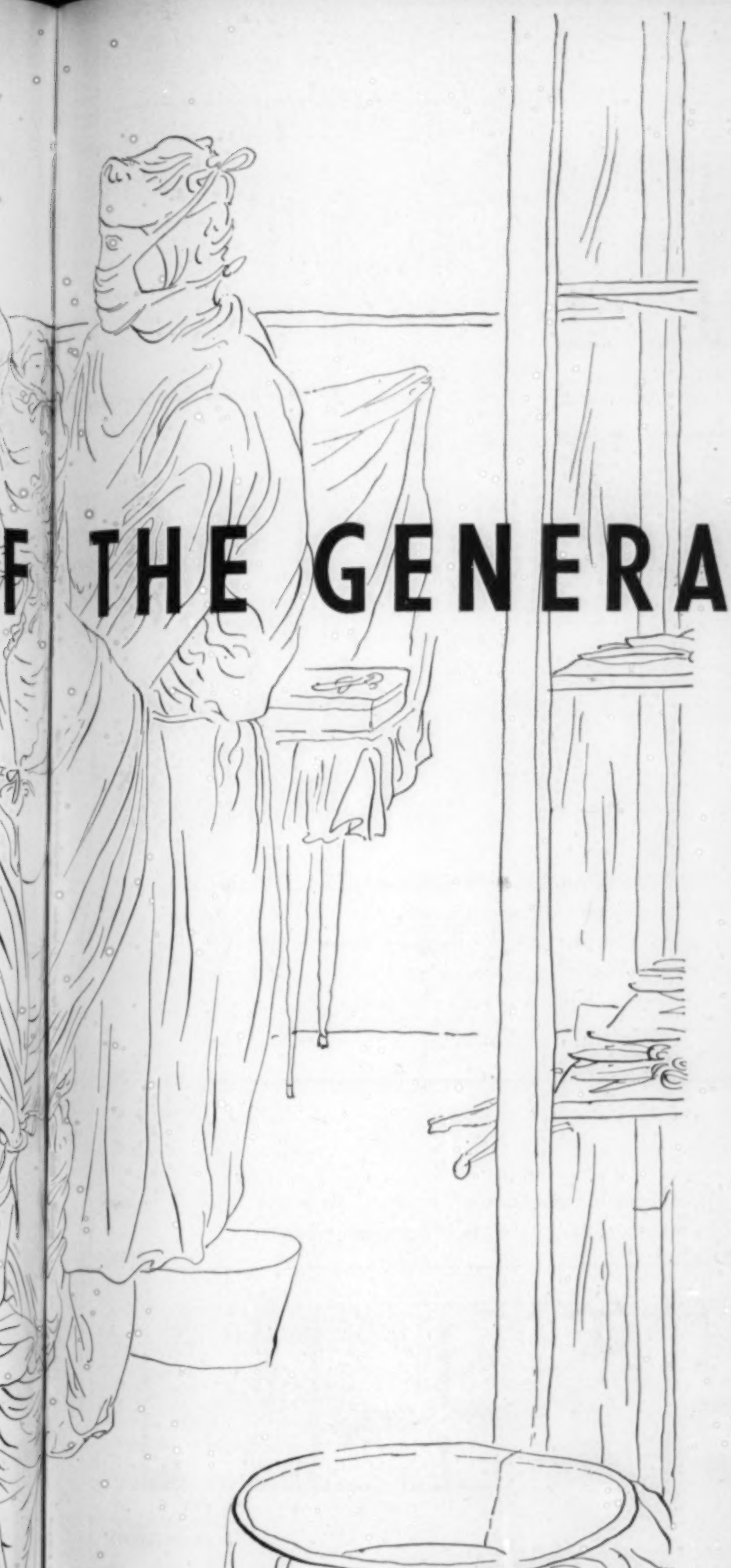


HOSPITAL FACILITIES SECTION

U. S. PUBLIC HEALTH SERVICE

Federal Security Agency

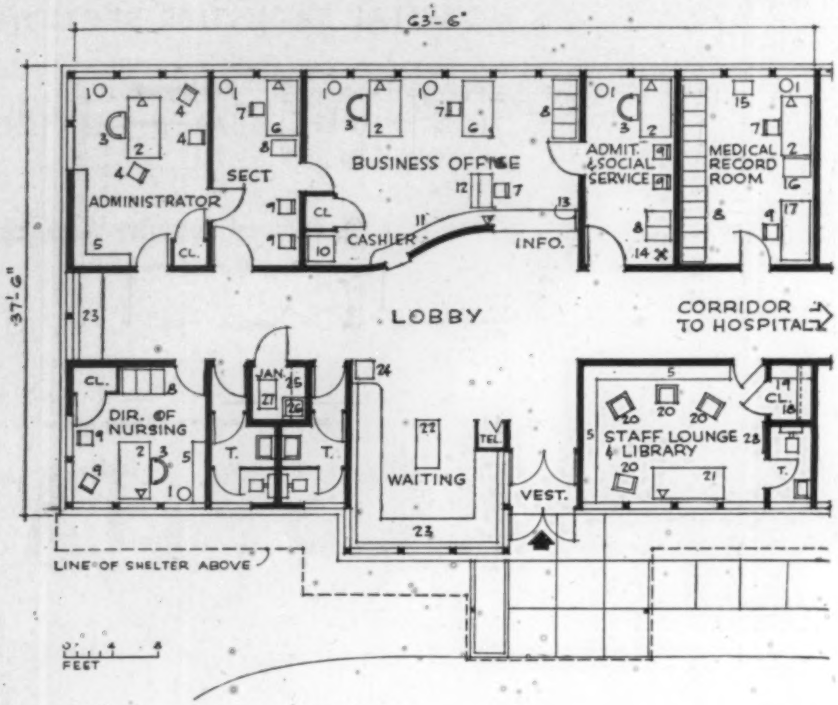
F THE GENERAL HOSPITAL



NEWS from Washington indicates that necessary nonresidential building projects are going forward, and that hospitals should be well up in the list of those permitted to escape the restrictions growing out of the G. I. house program. And reports from the field show plenty of current activity in hospital building. This has no direct reference to any federal-aid program that might result from the proposals of the U. S. Public Health Service for more hospital facilities in rural areas, which is embodied in a bill now before the Senate (S.191) and reported in ARCHITECTURAL RECORD in August, 1945.

A wide variety of demands for information on hospital planning from the Hospital Facilities Section (Technical Services Unit) of the Public Health Service has resulted in the publication of the material herewith, which amounts to a veritable planning guide for architects and hospital administrators. Architects who have come to know what a wealth of planning information has been gathered by Marshall Shaffer, chief architect, and staff, will welcome the publication of this series of plans of typical elements of the general hospital.

Physical requirements of hospital structures have changed extensively in recent years. Development of new diagnostic and therapeutic methods has brought about the need for new facilities and equipment. Improved methods of hospital administration have engendered similar problems. New construction materials and advances in construction design have resulted in basic revisions of building plans. These plans have resulted from innumerable consultations with doctors, nurses, hospital consultants, dietitians, hospital architects, hospital administrators, technicians, manufacturers and members of the U. S. Public Health Service and other agencies. The series starts in this issue of the RECORD, will continue next month.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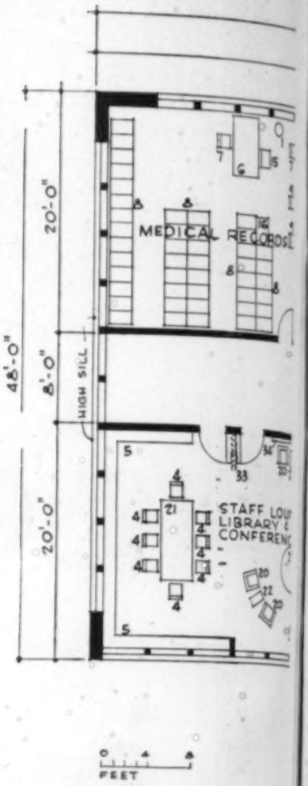
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1. Administration Suite for a 50-Bed General Hospital

Except for a few points, these plans speak for themselves. The medical record room is separate from the business office, where only business records are kept. Medical record room is placed opposite the staff lounge so that the medical librarian has a chance to catch physicians, in case it is necessary to urge them to get their records up to date. Doctors should be routed past the information desk to simplify keeping of the in-and-out register. The director of nursing is located near the hospital administrator, who naturally gets the sheltered corner location. In this small hospital suite, social service is combined with the admitting office since the small amount of social service work enables one person to handle both assignments

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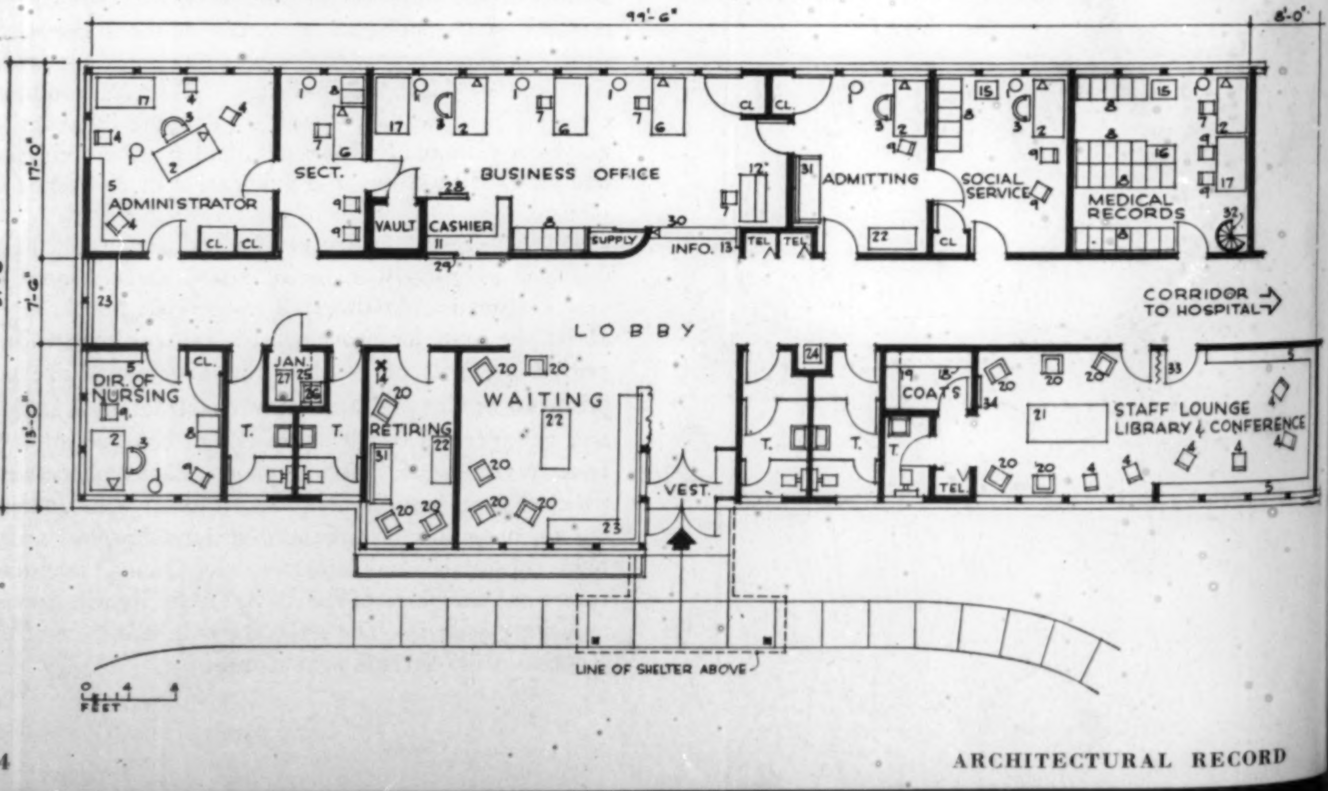
2. Administration Suite for a 100-Bed General Hospital

In this larger suite social service is given a separate office, since the increased load justifies separate personnel. And, in addition to general expansion of facilities, there has been added a retiring room, for the use of bereaved relatives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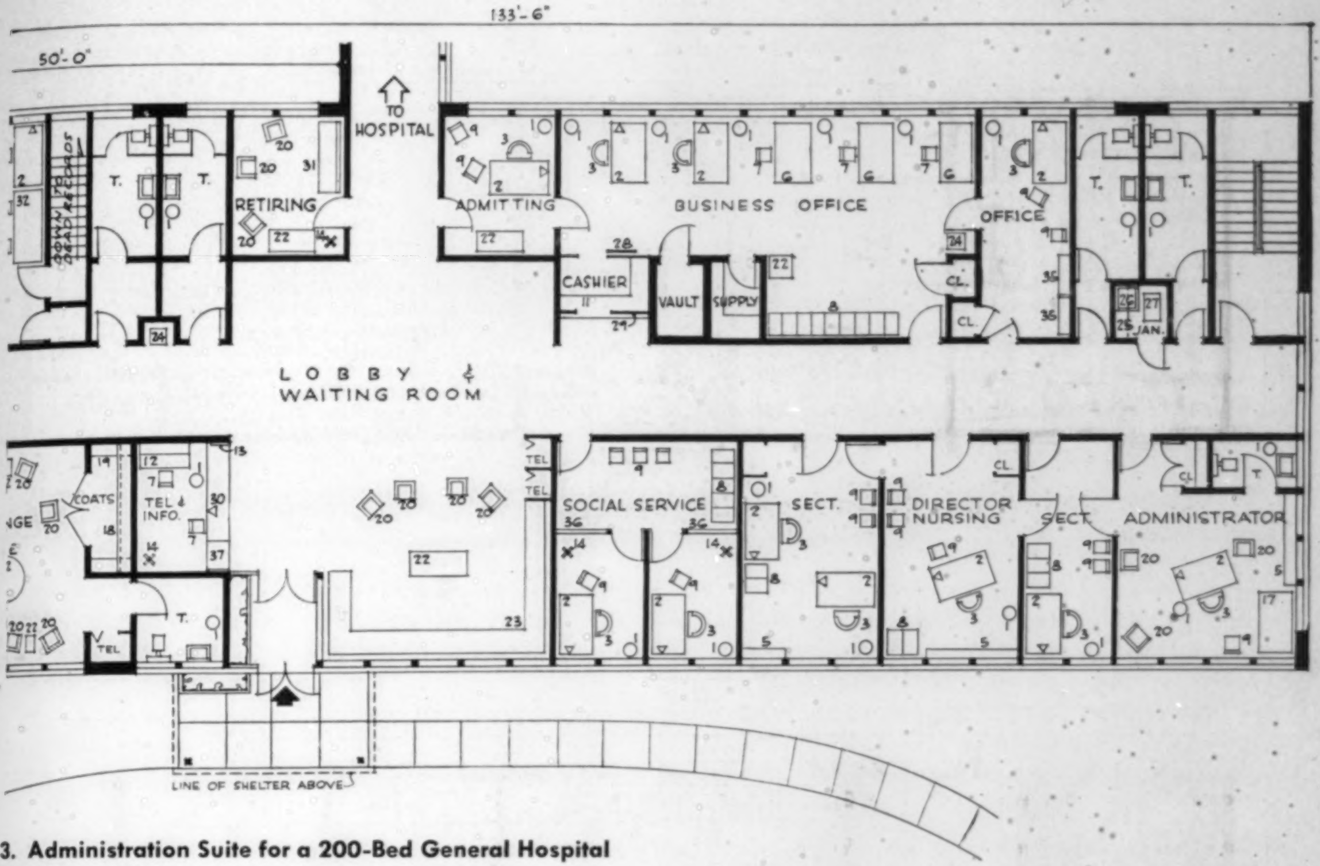

3. Administration Suite for a 200-Bed General Hospital

In the 200-bed hospital the administration suite logically becomes a separate wing, or indeed, as here, virtually a separate building. The same facilities are provided as in the 100-bed hospital, but naturally enlarged for the increased load, and the same principles hold: the staff lounge and library, here with conference facilities added, is still near the medical records room; administrator and director of nursing, with secretarial staff, are together in a protected suite; social service near the general business office

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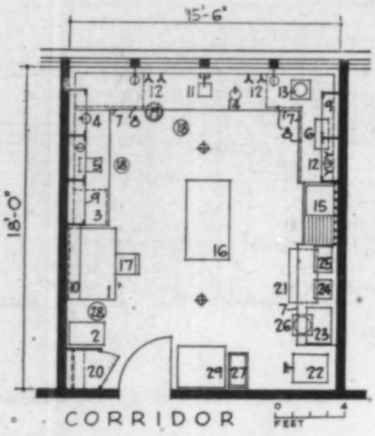
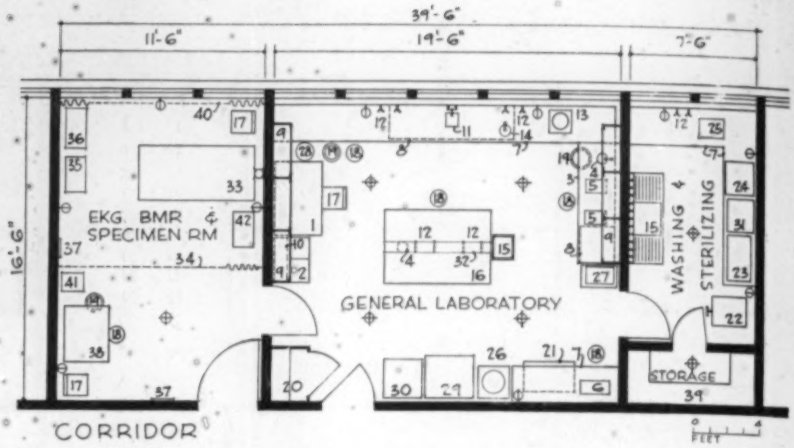
Legends: 1. Administration Suite for a 50-Bed General Hospital. **1.** Waste paper receptacle. **2.** Executive-type desk. **3.** Executive-type chair. **4.** Straight chair, upholstered. **5.** Built-in bookshelves. **6.** Typist's desk. **7.** Typist's chair. **8.** Filing cabinet. **9.** Straight chair. **10.** Safe. **11.** Counter, 40 in. high, cash drawer, with cabinets and drawers below. **12.** Telephone switchboard. **13.** Doctor's in-and-out register. **14.** Costumer. **15.** Typewriter table. **16.** Card index file. **17.** Table, 34 by 60 in. **18.** Hat shelf with clothes rod below. **19.** Shelf, 2 ft. above floor. **20.** Easy chair. **21.** Conference table. **22.** Table. **23.** Built-in bench. **24.** Water cooler. **25.** Shelf. **26.** Janitor's service sink. **27.** Mop truck. **28.** Bulletin board, 26 by 24 in.

2. Administration Suite for 100-Bed General Hospital. **1.** Waste paper receptacle. **2.** Executive-type desk. **3.** Executive-type chair. **4.** Straight chair, upholstered. **5.** Built-in bookshelves. **6.** Typist's desk. **7.** Typist's chair. **8.** Filing cabinet. **9.** Straight chair. **11.** Counter, 40 in. high, cash drawer, with cabinets and drawers below. **12.** Telephone switchboard. **13.** Doctors' in-and-out register. **14.** Costumer. **15.** Typewriter table. **16.** Card index file. **17.** Table, 34 by 60 in. **18.** Hat shelf with clothes rod below. **19.** Shelf, 2 ft. above floor. **20.** Easy chair. **21.** Conference table. **22.** Table. **23.** Built-in bench. **24.** Water cooler. **25.** Shelf. **26.** Janitor's service sink. **27.** Mop truck. **28.** Wire mesh partition with sliding gate. **29.** Glass screen. **30.** Counter, 48 in. high, open below. **31.** Three passenger settee. **32.** Spiral stairway down to dead record room. **33.** Collapsible partition. **34.** Bulletin board, 26 by 24 in.

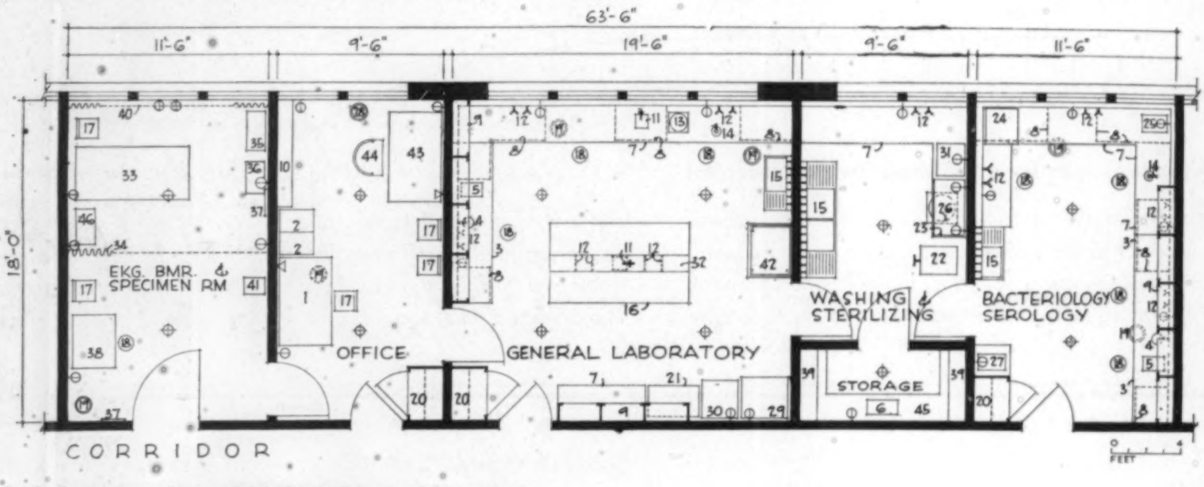
3. Administration Suite for a 200-Bed General Hospital. **1.** Waste paper receptacle. **2.** Executive-type desk. **3.** Executive-type chair. **4.** Straight chair, upholstered. **5.** Built-in bookshelves. **6.** Typist's desk. **7.** Typist's chair. **8.** Filing cabinet. **9.** Straight chair. **11.** Counter, 40 in. high, cash drawer, with cabinets and drawers below. **12.** Telephone switchboard. **13.** Doctors' in-and-out register. **14.** Costumer. **15.** Typewriter table. **16.** Card index file. **17.** Table, 34 by 60 in. **18.** Hat shelf with clothes rod below. **19.** Shelf, 2 ft. above floor. **20.** Easy chair. **21.** Conference table. **22.** Table. **23.** Built-in bench. **24.** Water cooler. **25.** Shelf. **26.** Janitor's service sink. **27.** Mop truck. **28.** Wire mesh partition with sliding gate. **29.** Glass screen. **30.** Counter, 48 in. high, open below. **31.** Three passenger settee. **32.** Table, 34 by 72 in. **33.** Collapsible partition. **34.** Bulletin board, 26 by 24 in. **35.** Bookcase. **36.** Translucent glazing. **37.** Counter, lift top and gate front.



4. Laboratory for a 50-Bed General Hospital



5. Laboratory for a 100-Bed General Hospital



6. Laboratory for a 200-Bed General Hospital

Legends: 4. Laboratory for a 50-Bed General Hospital. **1.** Desk. **2.** Filing cabinet. **3.** Microscope table, 30 in. high, with cabinets and slide drawers below. **4.** Cup sink with gooseneck spout. **5.** Microscope. **6.** Analytical balance with weights. **7.** Acid resisting counter, 36 in. high. **8.** Cabinets below counter. **9.** Wall cabinets. **10.** Book shelves. **11.** Acid resisting laboratory sink with gooseneck spout. **12.** Air, gas and electric outlets. **13.** Single element hot plate. **14.** Bunsen burner. **15.** Acid resisting laboratory sink with peg boards. **16.** Table, 30 by 54 in. **17.** Straight chair. **18.** Stool. **19.** Sanitary waste receptacle. **20.** Closet. **21.** Wheel cart for frozen sections. **22.** Laboratory autoclave, 16 by 24 in. **23.** Hot air sterilizer, 18 by 14 by 14 in. **24.** Incubator, 12 by 12 by 12 in. **25.** Water bath. **26.** Centrifuge. **27.** Shaking machine on stand. **28.** Waste paper receptacle. **29.** Refrigerator, 8 cu. ft.

5. Laboratory for a 100-Bed General Hospital. **1.** Desk. **2.** Filing cabinet. **3.** Microscope table, 30 in. high, with cabinets and slide drawers below. **4.** Cup sink with gooseneck spout. **5.** Microscope. **6.** Analytical balance with weights. **7.** Acid resisting counter, 36 in. high. **8.** Cabinets below counter. **9.** Wall cabinets. **10.** Book shelves. **11.** Acid resisting laboratory sink with gooseneck spout. **12.** Air, gas and electric outlets. **13.** Single element hot plate. **14.** Bunsen burner. **15.** Acid resisting laboratory sink with peg boards. **16.** Chemistry table. **17.** Straight chair. **18.** Stool. **19.** Sanitary waste receptacle. **20.** Closet. **21.** Wheel cart for frozen sections. **22.** Laboratory autoclave, 16 by 24 in. **23.** Hot air sterilizer, 24 by 14 by 14 in. **24.** Incubator, 19 by 16 by 14 in. **25.** Water bath. **26.** Centrifuge. **27.** Shaking machine on stand. **28.** Waste paper receptacle. **29.** Refrigerator, 8 cu. ft. **30.** Refrigerator, 6 cu. ft. **31.** Arnold sterilizer. **32.** Shelves over chemistry table. **33.** Hospital bed. **34.** Cubicle curtain rod and curtain. **35.** Basal metabolism apparatus. **36.** Electrocardiograph apparatus. **37.** Hook strip. **38.** Table, 30 by 36 in. **39.** Shelving. **40.** Sliding window curtain. **41.** Adult scale. **42.** Bedside table.

6. Laboratory for a 200-Bed General Hospital. **1.** Desk. **2.** Filing cabinet. **3.** Microscope table, 30 in. high, with cabinets and slide drawers below. **4.** Cup sink with gooseneck spout. **5.** Microscope. **6.** Analytical balance with weights. **7.** Acid resisting counter, 36 in. high. **8.** Cabinets below counter. **9.** Wall cabinets. **10.** Book shelves. **11.** Acid resisting laboratory sink with gooseneck spout. **12.** Air, gas and electric outlets. **13.** Single element hot plate. **14.** Bunsen burner. **15.** Acid resisting laboratory sink with peg boards. **16.** Chemistry table. **17.** Straight chair. **18.** Stool. **19.** Sanitary waste receptacle. **20.** Closet. **21.** Wheel cart for frozen sections. **22.** Laboratory autoclave, 16 by 24 in. **23.** Hot air sterilizer, 30 by 24 by 18 in. **24.** Incubator, 28 by 18 by 20 in. **25.** Water bath. **26.** Centrifuge. **27.** Shaking machine on stand. **28.** Waste paper receptacle. **29.** Refrigerator, 8 cu. ft. **30.** Refrigerator, 6 cu. ft. **31.** Arnold sterilizer. **32.** Shelves over chemistry table. **33.** Hospital bed. **34.** Cubicle curtain rod and curtain. **35.** Basal metabolism apparatus. **36.** Electrocardiograph apparatus. **37.** Hook strip. **38.** Table, 30 by 36 in. **39.** Shelving. **40.** Sliding window curtain. **41.** Adult scale. **42.** Fume hood. **43.** Executive-type desk. **44.** Executive-type chair. **45.** Counter, 36 in. high, cabinets below. **46.** Bedside table.

Legends: 7. Morgue and Autopsy Room for a 50-Bed General Hospital. **1.** Mortuary refrigerator for two bodies. **2.** Waste paper receptacle. **3.** Combination instrument and scrub sink with gooseneck spout and spray and knee control. **4.** Instrument sterilizer, 9 by 10 by 20 in., on stand. **5.** Shelf over sink. **6.** Cabinet below counter. **7.** Double recessed view box. **8.** Counter, 36 in. high, open below. **9.** Floor drain. **10.** Autopsy table with sink. **11.** Mayo table. **12.** Scales. **13.** Footstool. **14.** Kick bucket. **15.** Light. **16.** Hook strip. **17.** Specimen cabinet with glazed doors. **18.** Metal top table, 16 by 20 in. **19.** Suction apparatus. **20.** Ventilator fan. **21.** Telephone outlet. **22.** Obscure glass.

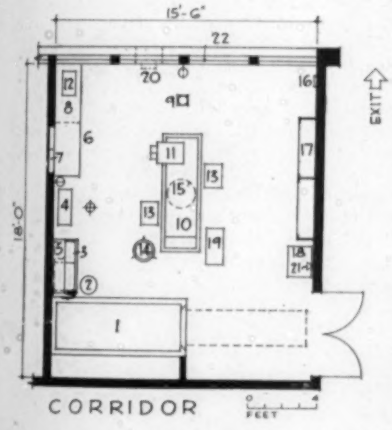
8. Morgue and Autopsy Suite for 100- or 200-Bed General Hospital. **1.** Mortuary refrigerator; for 100-bed hospital, two bodies; for 200-bed hospital, not less than three bodies. **2.** Waste paper receptacle. **3.** Combination instrument and scrub sink with gooseneck spout and spray and knee control. **4.** Instrument sterilizer, 9 by 10 by 20 in., on stand. **5.** Shelf over sink. **6.** Cabinet below counter. **7.** Double recessed view box. **8.** Counter, 36 in. high, open below. **9.** Floor drain. **10.** Autopsy table with sink. **11.** Mayo table. **12.** Scales. **13.** Footstool. **14.** Kick bucket. **15.** Light. **16.** Hook strip. **17.** Specimen cabinet with glazed doors. **18.** Portable observation stand. **19.** Suction apparatus. **20.** Ventilating fan. **21.** Telephone outlet. **22.** Obscure glass. **23.** Stretcher. **24.** View panel.

9. Morgue and Autopsy Suite for 200-Bed General Hospital. **1.** Mortuary refrigerator for four bodies. **2.** Waste paper receptacle. **3.** Combination instrument and scrub sink with gooseneck spout and spray and knee control. **4.** Instrument sterilizer, 9 by 10 by 20 in., on stand. **5.** Shelf over sink. **6.** Cabinet below counter. **7.** Double recessed view box. **8.** Counter, 36 in. high, open below. **9.** Floor drain. **10.** Autopsy table with sink. **11.** Mayo table. **12.** Scales. **13.** Footstool. **14.** Kick bucket. **15.** Light. **16.** Hook strip. **17.** Specimen cabinet with glazed doors. **18.** Portable observation stand. **19.** Suction apparatus. **20.** Ventilating fan. **21.** Telephone outlet. **22.** Obscure glass. **23.** Stretcher. **24.** View panel. **25.** Table, 30 by 84 in. **26.** Closet.

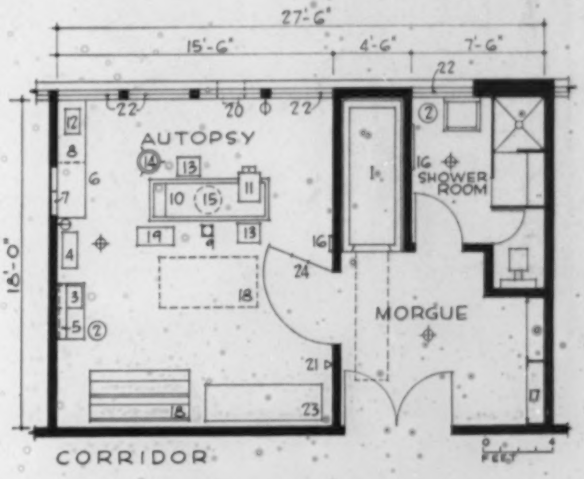
NOTE: This arrangement is recommended for a 200-bed or larger hospital when facilities are to be utilized by a medical examiner.

The small morgue in Fig. 7 is about the minimum room in which any autopsy work can be done. The next larger one, Fig. 8, might do for either a 100-bed or a 200-bed hospital; for the larger one it should have refrigerated space for at least three bodies. The separation of body refrigerator from autopsy room permits removal of a body while an autopsy is in progress in the other room.

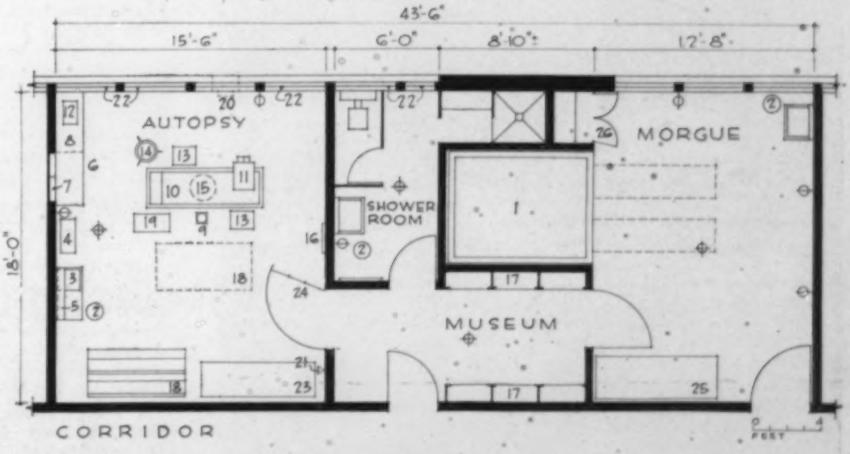
The size of the morgue depends to a certain extent on whether or not the facilities will be used by a medical examiner. In any case, of course, the morgue should be located so as to prevent unnecessary contact of the general public, convenient to the elevator, with an isolated exit, if possible, to the service yard. Adequate ventilation is an obvious requirement, usually a window exhaust fan



7. Morgue for a 50-Bed General Hospital

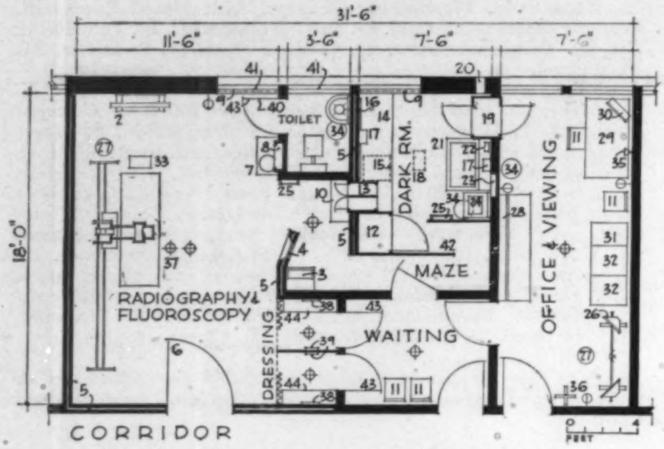


8. Morgue for a 100- or 200-Bed General Hospital



9. Morgue for a 200-Bed General Hospital

RADIOGRAPHIC SUITES



The X-ray department should be conveniently located with respect to the out-patient department as well as the rest of the hospital, for it will be heavily used for outside patients. A first-floor location will usually be found to keep traffic at a minimum. The X-ray room itself should be enclosed in partitions with lead linings, the size and extent of which will vary. The toilet is needed because barium solutions must be evacuated. The arrangement of dressing booths shown is recommended, to permit patients to enter or leave without going through the X-ray room itself. The increased load in the larger hospital requires two radiography units and a separate area for viewing and filing films. There is also space for storing a mobile X-ray unit for use in other rooms

10. Radiographic Suite for a 50- or 100-Bed General Hospital

Photo Courtesy of U. S. Public Health Service

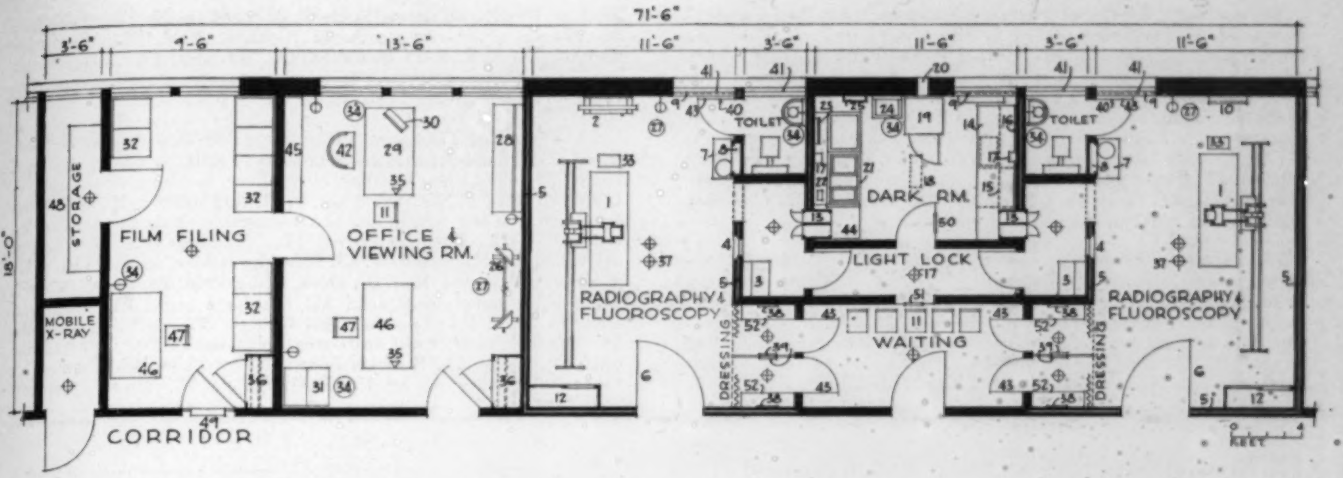
Legends: 10. Radiographic Suite for a 50- or 100-Bed General Hospital. **1.** Combination radiographic and fluoroscopic unit. **2.** Cassette changer. **3.** Control unit. **4.** Leaded glass view window. **5.** Lead lining (size and extent varies). **6.** Lead-lined door, light proofed. **7.** Barium sink. **8.** Recessed cabinet. **9.** Light-proof shade. **10.** Low cabinet for supplies. **11.** Straight chair. **12.** Storage cabinet. **13.** Cassette pass box. **14.** Film loading counter with cabinets below. **15.** Film storage bin. **16.** Film hanger racks. **17.** Safe light. **18.** Ceiling light, white and red. **19.** Two-door film dryer. **20.** Film dryer exhaust. **21.** Developing tank with thermostatic mixing valve. **22.** Timer. **23.** View box, wall mounted. **24.** Sink. **25.** Towel bar. **26.** Stereoscope. **27.** Adjustable stool. **28.** Wall-mounted view box, 2 units of 4 each. **29.** Executive-type desk. **30.** View box. **31.** Filing cabinet, letter size, 4 drawers. **32.** Film filing cabinet, 3 drawers. **33.** Footstool. **34.** Waste paper receptacle. **35.** Telephone outlet. **36.** Costumer. **37.** Fluoroscopic ceiling light. **38.** Hook strip. **39.** Mirror. **40.** Hook on door. **41.** Obscure glass. **42.** Movable partition. **43.** Light-proofed door. **44.** Seat.

NOTE: Maze should be painted dull black. If mobile X-ray unit is to be kept in this area, a storage closet should be provided.

11. Radiographic Suite for a 200-Bed General Hospital. **1.** Combination radiographic and fluoroscopic unit. **2.** Cassette changer. **3.** Control unit. **4.** Leaded glass view window. **5.** Lead lining (size and extent varies). **6.** Lead-lined door, light proofed. **7.** Barium sink. **8.** Recessed cabinet. **9.** Light-proof shade. **10.** Cassette tunnel. **11.** Straight chair. **12.** Storage cabinet. **13.** Cassette pass box. **14.** Film loading counter, 36 in. high, with cabinets, cassette bins and film storage bins below. **15.** Wall cabinet (bottom 3 ft. 8 in. above counter). **16.** Film hanger racks. **17.** Safe light. **18.** Ceiling light, white and red. **19.** Film dryer. **20.** Film dryer exhaust. **21.** Developing tank with thermostatic mixing valve. **22.** Timer. **23.** View box, wall mounted. **24.** Sink. **25.** Towel bar. **26.** Stereoscope. **27.** Adjustable stool. **28.** Wall mounted view box, 2 units of 4 each. **29.** Executive-type desk. **30.** View box. **31.** Filing cabinet, letter size, 4 drawers. **32.** Film filing cabinet, 3 drawers. **33.** Footstool. **34.** Waste paper receptacle. **35.** Telephone outlet. **36.** Closet. **37.** Fluoroscopic ceiling light. **38.** Hook strip. **39.** Mirror. **40.** Hook on door. **41.** Obscure glass. **42.** Executive-type chair. **43.** Light-proofed door. **44.** Refrigerating unit. **45.** Book case. **46.** Typist's desk. **47.** Typist's chair. **48.** Shelving, 18 in. wide. **49.** Dutch door. **50.** Door with light-proof louver in upper panel. **51.** Door with light-proof louver in lower panel. **52.** Seat.

NOTE: Maze should be painted dull black.

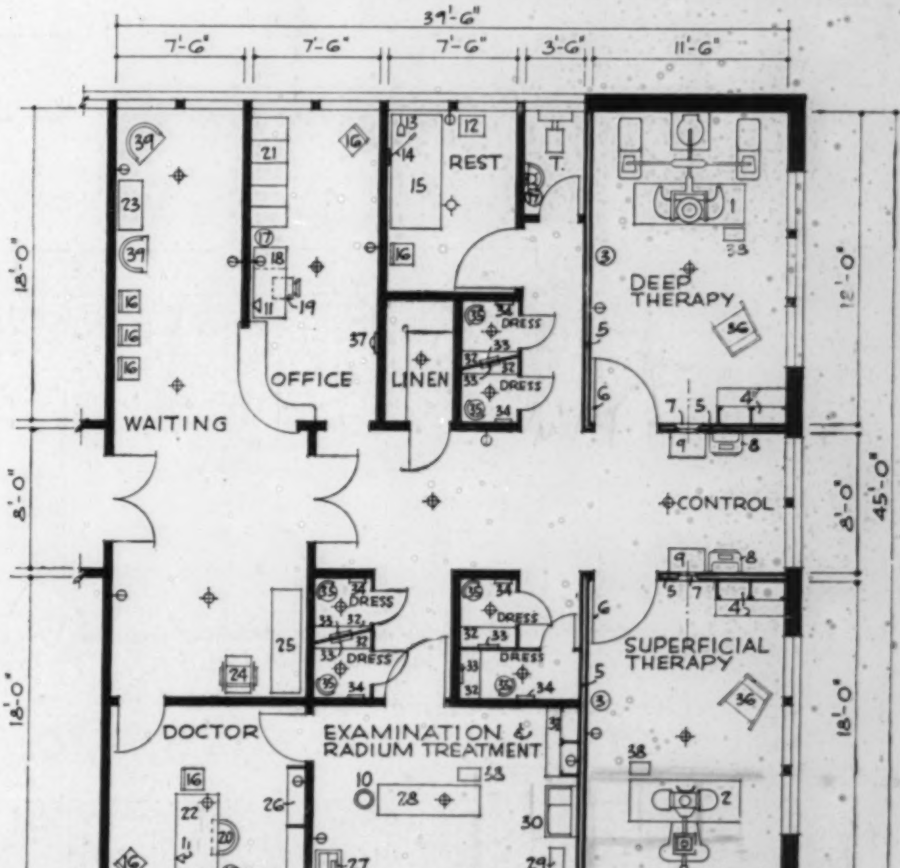
12. X-Ray Therapy Suite for a 200-Bed General Hospital. **1.** Deep therapy unit. **2.** Superficial therapy unit. **3.** Adjustable stool. **4.** Supply cabinet. **5.** Lead lining (size and extent varies for floors, walls and ceiling). **6.** Lead-lined door. **7.** Leaded glass view window. **8.** Control unit. **9.** Counter, 42 in. high. **10.** Sanitary waste receptacle. **11.** Telephone outlet. **12.** Bedside table. **13.** Bed light. **14.** Nurses calling station. **15.** Bed. **16.** Straight chair. **17.** Waste paper receptacle. **18.** Typewriter desk. **19.** Typist's chair. **20.** Desk chair. **21.** Film filing cabinet. **22.** Desk. **23.** Table, 12 by 26 in. **24.** Wheel chair. **25.** Wheel stretcher. **26.** Bookcase. **27.** Cautery. **28.** Examining table. **29.** Instrument sterilizer, 4 by


71'-6"
3'-6"
9'-6"
13'-6"
11'-6"
3'-6"
11'-6"
3'-6"
11'-6"
18'-0"
STORAGE
FILM FILING
MOBILE X-RAY
OFFICE & VIEWING RM.
RADIOGRAPHY & FLUOROSCOPY
TOILET
DARK RM.
LIGHT LOCK
WAITING
DRESSING
TOILET
DRESSING
RADIOGRAPHY & FLUOROSCOPY
CORRIDOR
FEET

11. Radiographic Suite for a 200-Bed General Hospital

---

6 by 16 in. **30.** Combination instrument and scrub sink, with gooseneck spout and knee control. **31.** Instrument cabinet. **32.** Shelf — 31 in. high. **33.** Mirror. **34.** Hook strip. **35.** Stool with back. **36.** Non-metallic treatment chair. **37.** Dome-light and buzzers. **38.** Footstool. **39.** Easy chair.


39'-6"
7'-6"
7'-6"
7'-6"
3'-6"
11'-6"
18'-0"
8'-0"
18'-0"
18'-0"
8'-0"
45'-0"
18'-0"
REST
T.
DEEP THERAPY
OFFICE
LINEN
DRESS
DRESS
WAITING
CONTROL
DRESS
DRESS
DRESS
SUPERFICIAL THERAPY
DOCTOR
EXAMINATION & RADIUM TREATMENT
FEET

12. X-Ray Therapy Suite for a 200-Bed General Hospital

The large hospital may be expected to have a heavy load of X-ray therapy, and will require separate facilities — separate from radiography and fluoroscopy. The department should be in a dead-end location so that no through traffic will be necessary. The doctor's office should be located near the waiting room, for pre-treatment consultation, also near the examination room. A rest room is provided convenient to the deep therapy room, as such treatment frequently requires a period of rest following it. The control room is separate from either X-ray room, with lead-lined partitioning, for the safety of the operators

PHYSICAL THERAPY SUITES

Legends: 13. Physical Therapy Suite for a 50-Bed General Hospital. 1. Treatment table. 2. Short wave unit. 3. Table. 4. Linen closet. 5. Soiled linen hamper, closet over. 6. Ultra violet unit. 7. Infra red unit. 8. Straight chair. 9. Ceiling mirror. 10. Combination arm and leg whirlpool. 11. Adjustable chair for arm or leg treatment. 12. Posture mirror. 13. Non-skid mat with crutch markings. 14. High shelves. 15. Shoulder ladder. 16. Stall bars. 17. Walker. 18. Glazed door. 19. Desk, 28 by 48 in. 20. Low filing cabinet. 21. Waste paper receptacle. 22. Hanging rod. 23. Adjustable shelves. 24. Sink. 25. Glass shelf. 26. Wringer. 27. Curtains and rods. 28. Bulletin board, 26 by 24 in.

14. Physical Therapy Suite for a 100-Bed General Hospital. 1. Treatment table. 2. Short wave unit. 3. Table. 4. Linen closet. 5. Soiled linen hamper, closet over. 6. Ultra violet unit. 7. Infra red unit. 8. Straight chair. 9. Ceiling mirror. 10. Combination arm and leg whirlpool. 11. Adjustable chair for arm or leg treatment. 12. Posture mirror. 13. Non-skid mat with crutch markings. 14. High shelves. 15. Shoulder ladder. 16. Stall bars. 17. Walker. 18. Glazed door. 19. Desk, 28 by 54 in. 20. Filing cabinet. 21. Waste paper receptacle. 22. Glazed panel. 23. Adjustable shelves. 24. Sink. 25. Glass shelf. 26. Wringer. 27. Curtains and rods. 28. Paraffin tank. 29. Low voltage unit. 30. Steps. 31. Bulletin board, 26 by 24 in.

15. Physical Therapy Suite for a 200-Bed General Hospital. 1. Treatment table. 2. Short wave unit. 3. Table. 4. Linen closet. 5. Soiled linen hamper, closet over. 6. Ultra violet unit. 7. Infra red unit. 8. Straight chair. 9. Ceiling mirror. 10. Combination arm and leg whirlpool. 11. Adjustable chair for arm or leg treatment. 12. Posture mirror. 13. Non-skid mat with crutch markings. 14. High shelves. 15. Shoulder ladder. 16. Stall bars. 17. Walker. 18. Glazed door. 19. Desk, 32 by 48 in. 20. Filing cabinet. 21. Waste paper receptacle. 22. Hubbard tank. 23. Mono-rail over. 24. Sink. 25. Glass shelf. 26. Wringer. 27. Curtains and rods. 28. Paraffin tank, built into treatment table. 29. Low voltage unit. 30. Steps. 31. Bulletin board, 26 by 24 in. 32. Typewriter table. 33. Locker, 15 by 15 in. 34. Bench. 35. Wheel stretcher.

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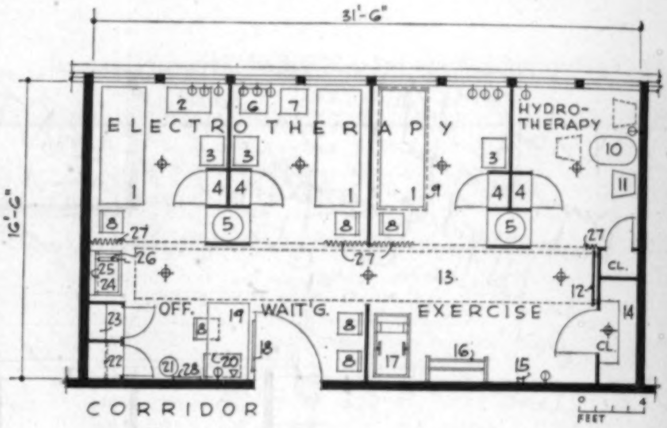
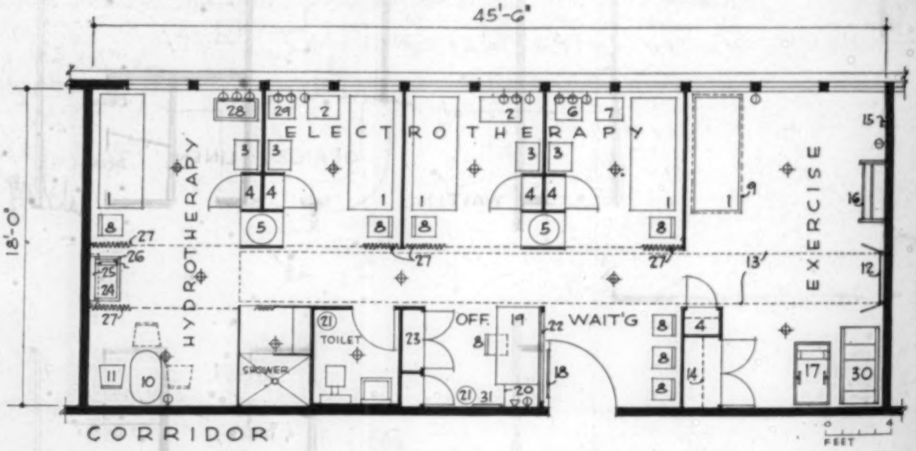
13. Physical Therapy Suite for a 50-Bed General Hospital

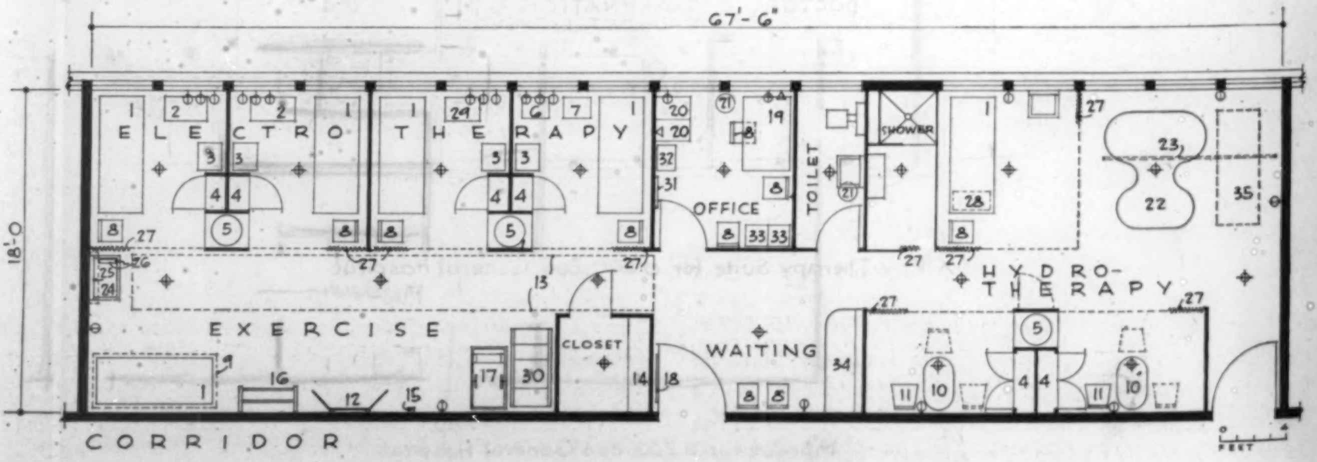


Physical therapy suites, like X-ray rooms, should be located for use by out-patients as well as in-patients. Flexibility is a highly important planning consideration, as needs in physical therapy are constantly changing. Also the equipment should be movable wherever possible. The problem is to provide enough flexible, sub-divided space so that patients can engage in the prescribed type of activity without interference with each other, and with privacy when required. However, it is found that the availability of a competent physical therapy technician is frequently a question, one which may in the end have much to do with the facilities provided

14. Physical Therapy Suite for a 100-Bed General Hospital

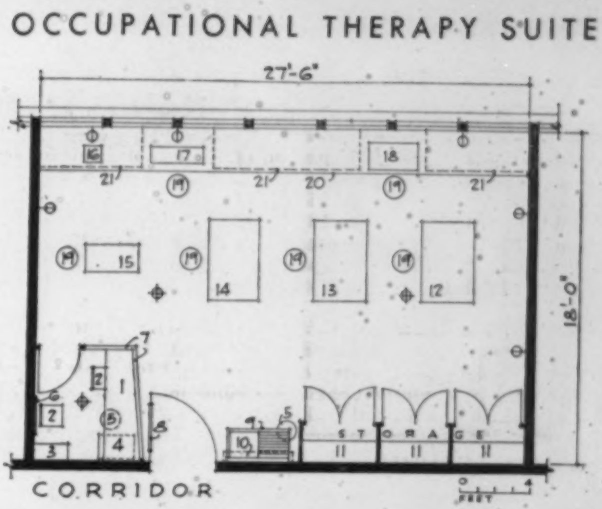


15. Physical Therapy Suite for a 200-Bed General Hospital



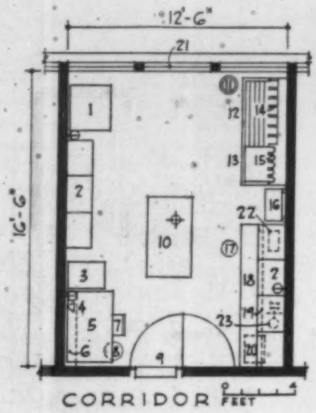
16. Occupational Therapy Suite for a 200-Bed General Hospital. 1. Desk. 2. Chair. 3. Bookcase. 4. Filing cabinet. 5. Waste paper receptacle. 6. Bulletin board, 26 by 24 in. 7. Glazed partitions. 8. Glazed panel. 9. Non-staining sink and drainboard. 10. Shelf over. 11. Adjustable shelves. 12. Leather work bench. 13. Metal work bench. 14. Carpentry work bench. 15. Bicycle jig saw. 16. Electric grinder. 17. Electric lathe. 18. Table loom. 19. Stool. 20. Counter, 30 in. high. 21. Storage under counter.

In this suite storage facilities are important, for there will be a wide variety of tools and paraphernalia. Where possible tables should be arranged for the supervisor to walk around them

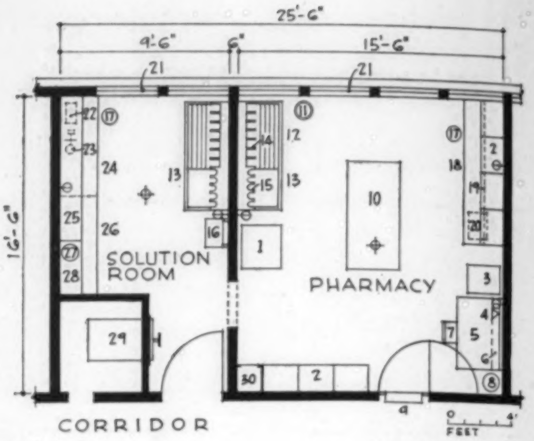

OCCUPATIONAL THERAPY SUITE
27'-6"
18'-0"
16
17
18
21
19
20
15
14
13
12
7
2
1
3
4
5
8
10
9
11
STORAGE
CORRIDOR
0
4
FEET

16. Occupational Therapy Suite for a 200-Bed General Hospital

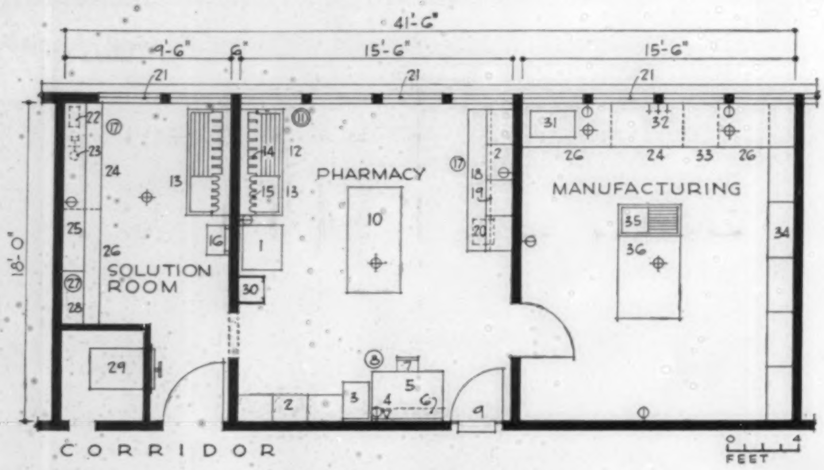
Photo courtesy of Presbyterian Medical Center



17. Pharmacy for a 50-Bed General Hospital



18. Pharmacy for a 100-Bed General Hospital



19. Pharmacy for a 200-Bed General Hospital

Here is another department that needs a location near the out-patient department, though here the problem is one of transportation only: there would be no patient traffic to the pharmacy. For the small hospital there is just the one room for the pharmacist; it is assumed that the small institution would not support even one pharmacist for his full time. In the next larger hospital a solution room is added, for it is considered advisable wherever possible to have the pharmacist mix all solutions. In the still larger one, manufacturing is undertaken on a fairly large scale, and the pharmacy begins to be a source of income

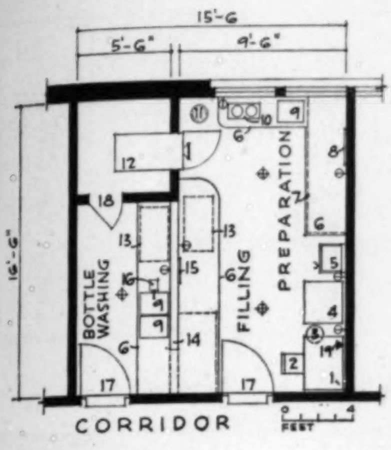
PAUL PARKER Photo—Courtesy of Presbyterian Medical Center

Orderliness and accuracy are essential in the pharmacy

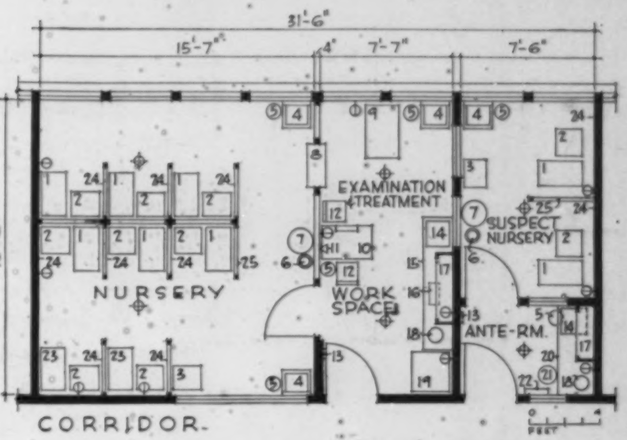
Legends: 17. Pharmacy for a 50-Bed General Hospital. **1.** Refrigerator, 8 cu. ft. **2.** Drug cabinet. **3.** Filing cabinet, letter size, 4 drawers. **4.** Telephone outlet. **5.** Desk. **6.** Book shelves. **7.** Straight chair. **8.** Waste paper receptacle. **9.** Dutch door. **10.** Table, 30 by 54 in. **11.** Sanitary waste receptacle. **12.** Cabinet below drainboard. **13.** Acid proof sink and drainboard. **14.** Drawing pegs. **15.** Graduate rack. **16.** Double element hot plate on bracket. **17.** Stool. **18.** Prescription counter with cabinets below. **19.** Fluorescent light below cabinet. **20.** Narcotics safe. **21.** Window guards. **22.** Prescription balance with weights. **23.** Counter scale with weights.

18. Pharmacy for a 100-Bed General Hospital. **1.** Refrigerator, 8 cu. ft. **2.** Drug cabinet. **3.** Filing cabinet, letter size, 4 drawers. **4.** Telephone outlet. **5.** Desk. **6.** Book shelves. **7.** Straight chair. **8.** Waste paper receptacle. **9.** Dutch door. **10.** Table, 30 by 54 in. **11.** Sanitary waste receptacle. **12.** Cabinet below drainboard. **13.** Acid proof sink and drainboard. **14.** Drawing pegs. **15.** Graduate rack. **16.** Double element hot plate on bracket. **17.** Stool. **18.** Prescription counter with cabinets below. **19.** Fluorescent light below cabinet. **20.** Narcotics safe. **21.** Window guards. **22.** Prescription balance with weights. **23.** Counter scale. **24.** Counter, 36 in. wide with water resistant top. **25.** Shelf, 18 in. above counter. **26.** Cabinets below counter. **27.** Water still, 5 gal. per hr. **28.** Shelf, 36 in. above counter. **29.** Rectangular sterilizer, 24 by 24 by 36 in., nickel clad. **30.** Locker.

19. Pharmacy for a 200-Bed General Hospital. **1.** Refrigerator, 8 cu. ft. **2.** Drug cabinet. **3.** Filing cabinet, letter size, 4 drawers. **4.** Telephone outlet. **5.** Desk. **6.** Book shelves. **7.** Straight chair. **8.** Waste paper receptacle. **9.** Dutch door. **10.** Table, 30 by 54 in. **11.** Sanitary waste receptacle. **12.** Cabinet below drainboard. **13.** Acid proof sink and drainboard. **14.** Drawing pegs. **15.** Graduate rack. **16.** Double element hot plate on bracket. **17.** Stool. **18.** Prescription counter with cabinets below. **19.** Fluorescent light below cabinet. **20.** Narcotics safe. **21.** Window guards. **22.** Prescription balance with weights. **23.** Counter scale. **24.** Counter, 36 in. wide with water resistant top. **25.** Shelf, 18 in. above counter. **26.** Cabinets below counter. **27.** Water still, 5 gal. per hr. **28.** Shelf, 36 in. above counter. **29.** Rectangular sterilizer, 24 by 24 by 36 in., nickel clad. **30.** Locker. **31.** Opaque glass insert in counter. **32.** Gas, compressed air and vacuum outlets. **33.** Drawers below counter. **34.** Adjustable metal shelves above counter height, cabinets below. **35.** Sink and drainboard. **36.** Table with soapstone top.


15'-6
5'-6"
9'-6"
16'-6"
BOTTLE WASHING
FILLING
PREPARATION
CORRIDOR
FEET

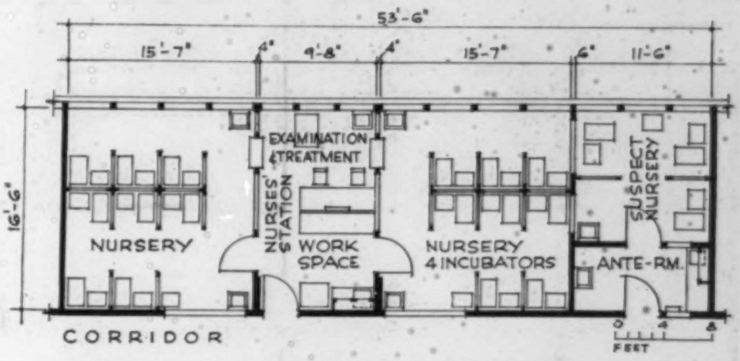
20. Milk Room


31'-6"
15'-7"
4"
7'-7"
7'-6"
16'-6"
NURSERY
EXAMINATION & TREATMENT
WORK SPACE
SUSPECT NURSERY
ANTE-RM.
CORRIDOR
FEET

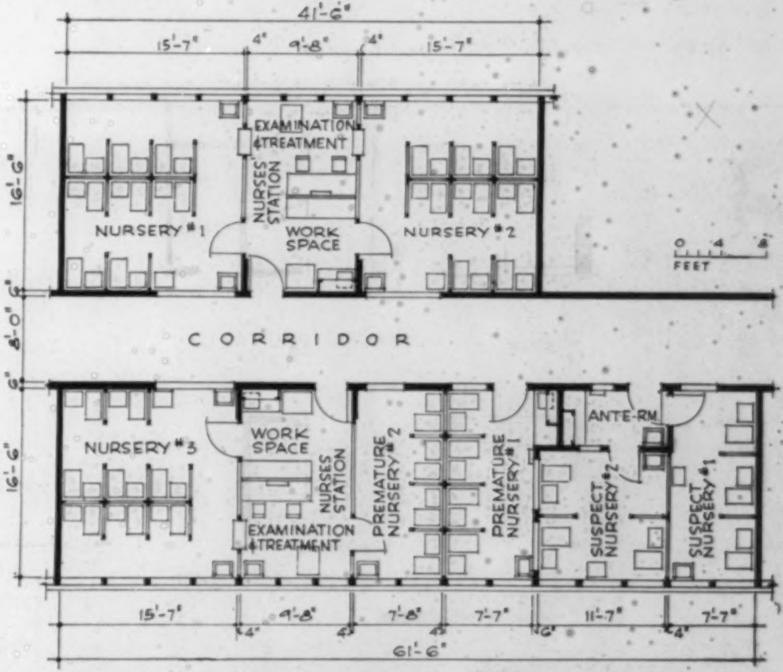
21. Nursery for a 50-Bed General Hospital

The milk room, for the preparation of babies' formulas, can be located either in the dietary quarters or near the nurseries. This one is designed for the so-called "terminal sterilization," in which everything is sterilized together; only "kitchen cleanliness" is required until bottles are filled and capped, then everything is sterilized in the "autoclave."

These nurseries (see ARCHITECTURAL RECORD *May, '43, pp. 76–77) are designed to minimize cross infections, especially for such highly contagious diseases as infant diarrhea, which has caused so many tragedies among new-born babies. Thus each unit has cribs for not more than eight infants, each in its separate cubicle. Each baby cubicle has its own supplies. Every precaution is taken to keep traffic to a minimum: nursery rooms are entered only through the work space, to improve control; work space is partitioned off, also treatment rooms and nurse's station, to keep all possible operations outside of the nursery room itself. Aside from the obvious benefits of isolation, this scheme makes it possible to shut off one room should there be any faint sign of infection, and other unaffected areas can continue in operation. Where such dispersion is not followed, it might be necessary to close virtually all nursery and obstetrical operations to end an epidemic. These plans were developed in cooperation with Children's Bureau, U. S. Department of Labor*


53'-6"
15'-7"
4"
9'-8"
4"
15'-7"
6"
11'-6"
16'-6"
EXAMINATION & TREATMENT
NURSES' STATION
WORK SPACE
NURSERY
NURSERY 4 INCUBATORS
SUSPECT NURSERY
ANTE-RM.
CORRIDOR
FEET

22. Nursery for a 100-Bed General Hospital


41'-6"
15'-7"
4"
9'-8"
4"
15'-7"
16'-6"
8'-0"
EXAMINATION & TREATMENT
NURSES' STATION
WORK SPACE
NURSERY #1
NURSERY #2
FEET
CORRIDOR
NURSERY #3
WORK SPACE
NURSES STATION
EXAMINATION & TREATMENT
PREMATURE NURSERY #2
PREMATURE NURSERY #1
ANTE-RM
SUSPECT NURSERY #2
SUSPECT NURSERY #1
15'-7"
9'-8"
7'-8"
7'-7"
11'-7"
7'-7"
61'-6"

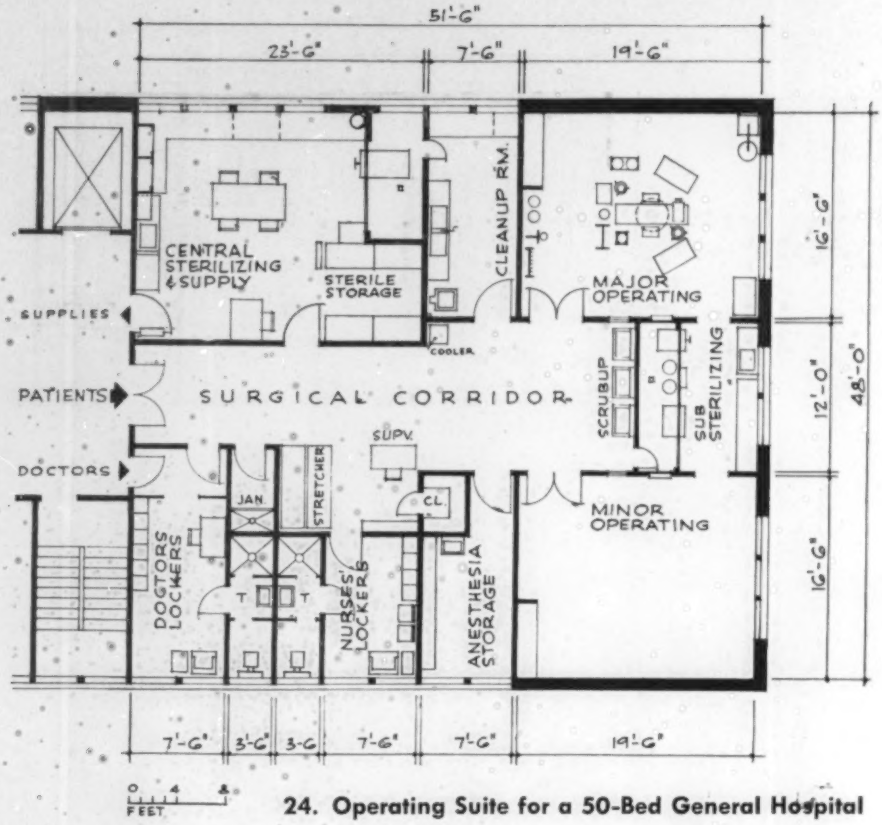
23. Nursery for a 200-Bed General Hospital

Legends: 20. Milk Room. **1.** Desk. **2.** Chair. **3.** Waste paper receptacle. **4.** Refrigerator. **5.** Lavatory with knee control. **6.** Counter, 36 in. high. **7.** Cabinets under counter. **8.** Bulletin board, 26 by 24 in. **9.** Sink. **10.** Two element hot plate. **11.** Sanitary waste receptacle. **12.** Rectangular pressure sterilizer, nickel clad. **13.** Milk cart. **14.** Partition, 5 ft. high. **15.** Holder for formula record book. **16.** Electric bottle washer. **17.** Dutch door. **18.** Access door. **19.** Telephone outlet.

21. Nursery for a 50-Bed General Hospital. **1.** Bassinet. **2.** Bedside cabinet. **3.** Table, 16 by 24 in. (for infant scale). **4.** Lavatory with gooseneck spout and knee control. **5.** Waste paper receptacle. **6.** Sanitary waste receptacle. **7.** Linen hamper. **8.** Pass window with shelf and sliding sash. **9.** Table, 24 by 36 in **10.** Nurses' desk with chart rack for 8 charts. **11.** Telephone outlet. **12.** Straight chair. **13.** Hook strip. **14.** Sink in counter with gooseneck spout and knee control. **15.** Counter, 36 in. high, with cabinets below. **16.** Instrument sterilizer, 4 by 6 by 16 in. **17.** Wall cabinet. **18.** Single element hot plate. **19.** Refrigerator, 6 cu. ft. **20.** Counter, 36 in. high, open below. **21.** Stool. **22.** Chart rack for 2 charts. **23.** Incubator. **24.** Gown hook. **25.** Cubicle partitions, 5 ft. 6 in. high, clear glass in upper panels.

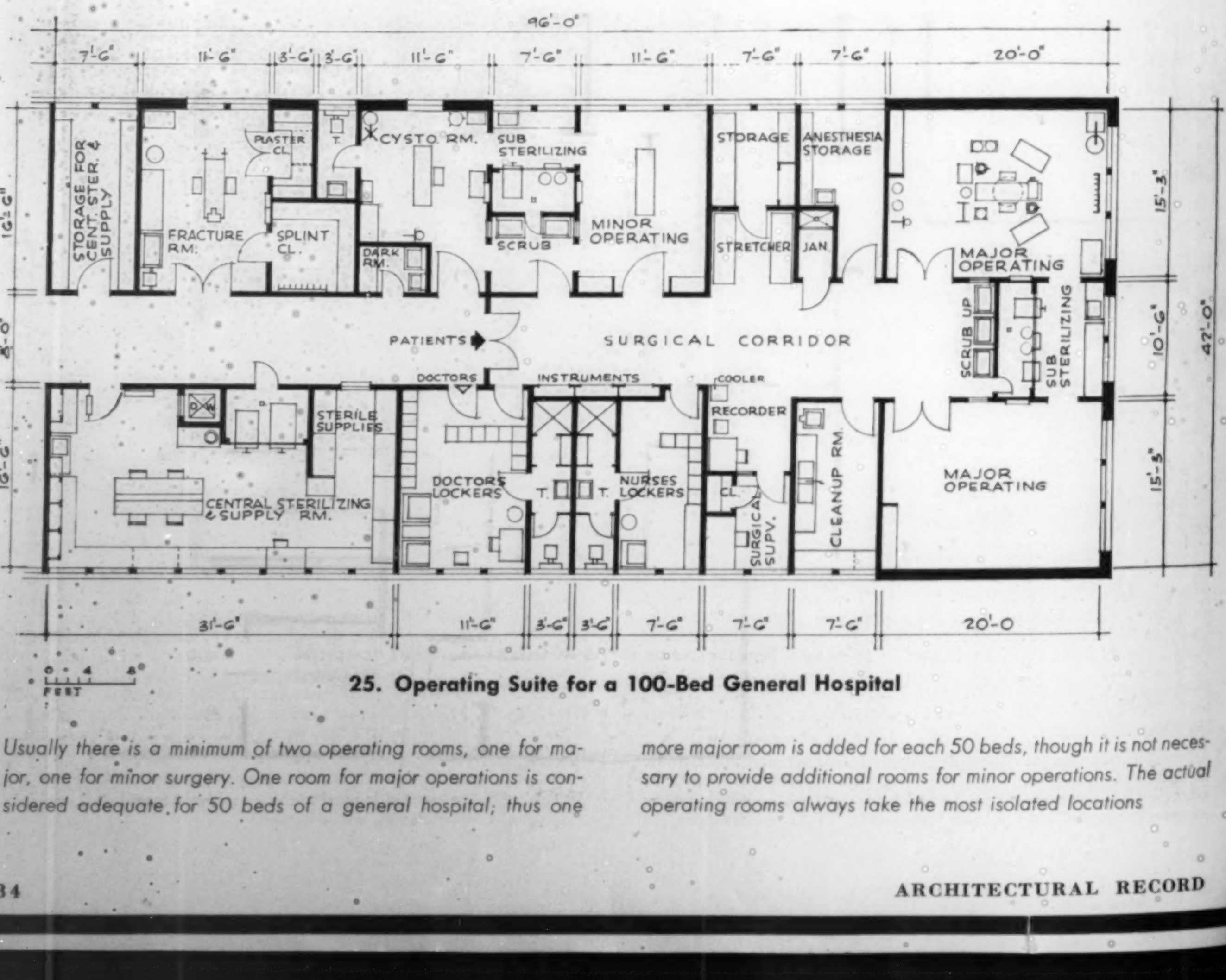
NOTE: Where use of large incubators is contemplated, cubicle size should be increased accordingly.

OPERATING SUITES


51'-6"
23'-6"
7'-6"
19'-6"
CENTRAL STERILIZING & SUPPLY
STERILE STORAGE
CLEANUP RM.
COOLER
MAJOR OPERATING
SUPPLIES
PATIENTS
DOCTORS
SURGICAL CORRIDOR
SCRUBUP
SUB STERILIZING
SUPV.
CL.
JAN.
STRETCHER
DOCTORS LOCKERS
NURSES' LOCKERS
DARK
ANESTHESIA STORAGE
MINOR OPERATING
T
16'-6"
12'-0"
48'-0"
16'-6"
7'-6"
3'-6"
3-6
7'-6"
7'-6"
19'-6"
0 4 8
FEET

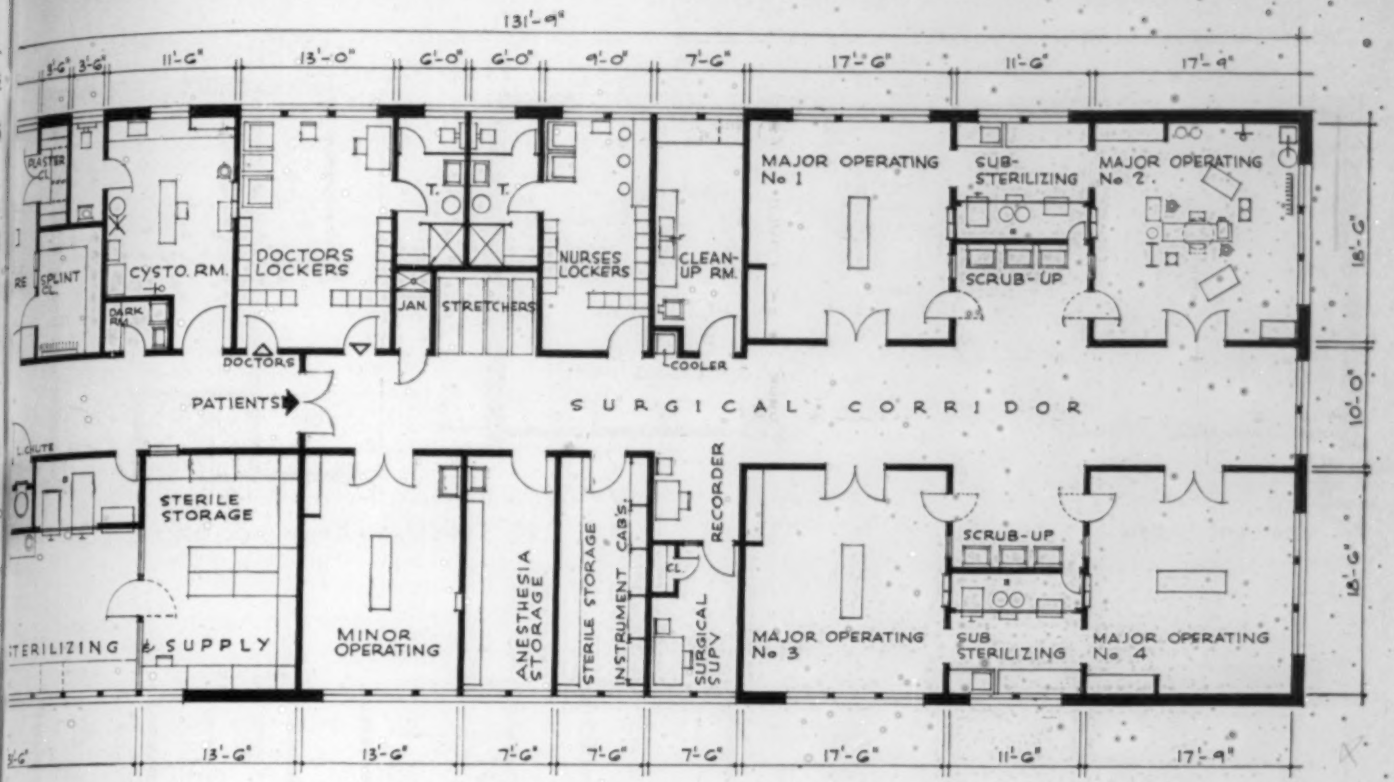
24. Operating Suite for a 50-Bed General Hospital

The operating suite is one of the hospital departments that requires a cul-de-sac location, as there is enough going on without any through traffic. The several entrances help separate the traffic and serve to minimize confusion


96'-0"
7'-6"
11'-6"
3'-6"
3'-6"
11'-6"
7'-6"
11'-6"
7'-6"
7'-6"
20'-0"
STORAGE FOR CENT. STER. & SUPPLY
FRACTURE RM.
PLASTER CL.
SPLINT CL.
T.
DARK RM.
CYSTO. RM.
SUB STERILIZING
SCRUB
MINOR OPERATING
STORAGE
ANESTHESIA STORAGE
STRETCHER
JAN.
MAJOR OPERATING
SCRUB UP
SUB STERILIZING
PATIENTS
SURGICAL CORRIDOR
DOCTORS
INSTRUMENTS
COOLER
RECORDER
CL.
D.W.
STERILE SUPPLIES
CENTRAL STERILIZING & SUPPLY RM.
DOCTORS LOCKERS
T.
NURSES LOCKERS
SURGICAL SUPV.
CLEANUP RM.
MAJOR OPERATING
16'-6"
8'-0"
16'-6"
15'-3"
10'-6"
15'-3"
42'-0"
31'-6"
11'-6"
3'-6"
3'-6"
7'-6"
7'-6"
7'-6"
20'-0
0 4 8
FEET

25. Operating Suite for a 100-Bed General Hospital

Usually there is a minimum of two operating rooms, one for major, one for minor surgery. One room for major operations is considered adequate for 50 beds of a general hospital; thus one more major room is added for each 50 beds, though it is not necessary to provide additional rooms for minor operations. The actual operating rooms always take the most isolated locations

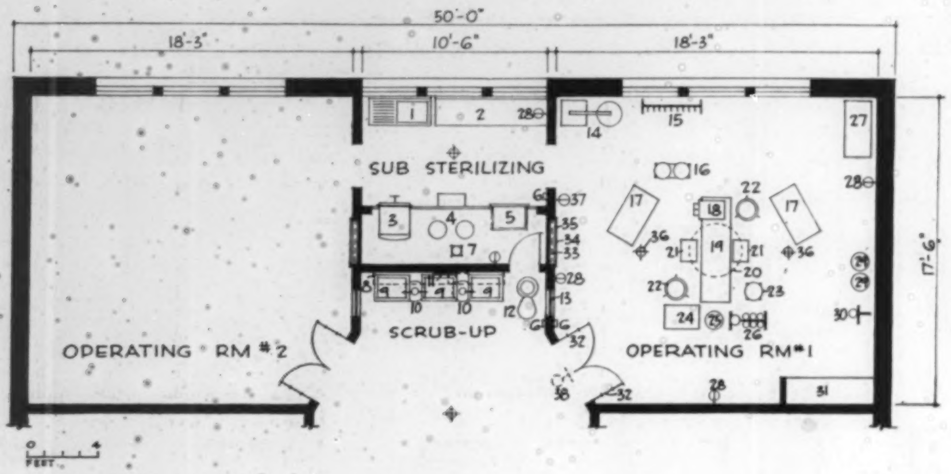

131'-9"
3'-6"
3'-6"
11'-6"
13'-0"
6'-0"
6'-0"
9'-0"
7'-6"
17'-6"
11'-6"
17'-9"
PLASTER CL.
SPLINT CL.
DARK RM.
CYSTO. RM.
DOCTORS LOCKERS
T.
T.
JAN.
STRETCHERS
NURSES LOCKERS
CLEAN-UP RM.
COOLER
MAJOR OPERATING No 1
SUB-STERILIZING
SCRUB-UP
MAJOR OPERATING No 2
18'-6"
10'-0"
18'-6"
DOCTORS
PATIENTS
SURGICAL CORRIDOR
L. CHUTE
STERILE STORAGE
STERILIZING & SUPPLY
MINOR OPERATING
ANESTHESIA STORAGE
STERILE STORAGE
INSTRUMENT CABS.
RECORDER
CL.
SURGICAL SUPPY
SCRUB-UP
MAJOR OPERATING No 3
SUB STERILIZING
MAJOR OPERATING No 4
3'-6"
13'-6"
13'-6"
7'-6"
7'-6"
7'-6"
17'-6"
11'-6"
17'-9"

26. Operating Suite for a 200-Bed General Hospital

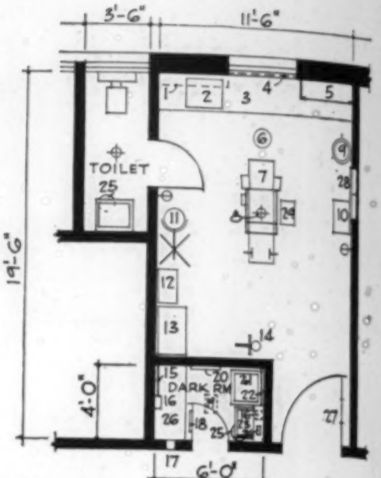
All of these departments are here planned to adjoin the central sterilizing and supply rooms. In the smaller building they can be within the operating department (with separate entrance) but in larger ones there gets to be too much traffic; the same general principle prevails, but central sterilizing moves out of the suite, somewhat farther from operating rooms, nearer hospital center

HUGH STERN Photo

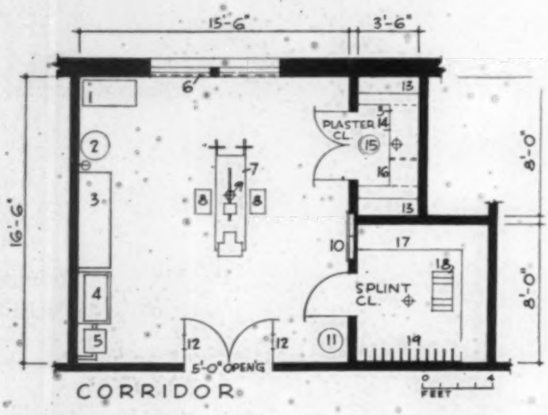
SURGICAL DEPARTMENT ROOMS



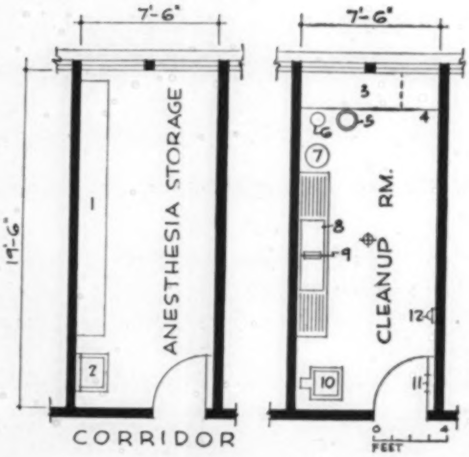
27. Operating Rooms



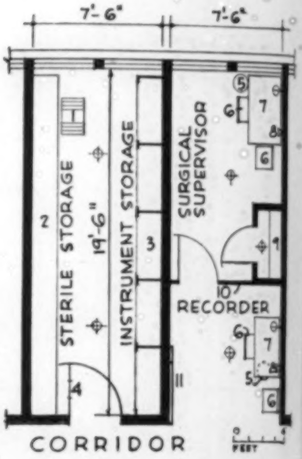
28. Cystoscopic Room



29. Fracture Room



30. (See legend)



31. (See legend)

In Fig. 27 sterilizing facilities are only for instruments, and for emergency work — most sterilizing is done in central room. In Fig. 28, cystoscopic room, both the toilet and the dark room are essential adjuncts. In the fracture room, Fig. 29, the doors must be large since many fracture cases are strapped up with rather ungainly contraptions. Plaster and splint closets must be large

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Legends: 27. Operating Rooms. **1.** Sink and drainboard. **2.** Counter, 36 in. high, open below. **3.** High speed pressure sterilizer, 16 by 24 in. **4.** Water sterilizers, 15 gal. ea. **5.** Blanket and solution warmer. **6.** Mercury switch. **7.** Floor drain. **8.** Glass shelf over scrub sinks. **9.** Scrub sink. **10.** Soap dispenser. **11.** Clock. **12.** Alcohol dispenser. **13.** View window, clear glass. **14.** Portable emergency light. **15.** Sponge rack. **16.** Double basin stand. **17.** Instrument table, 24 by 48 in. **18.** Mayo table. **19.** Operating table. **20.** Operating light. **21.** Footstool. **22.** Kick bucket. **23.** Single basin stand. **24.** Anesthetist's table. **25.** Anesthetist's stool. **26.** Anesthesia unit. **27.** Pack table. **28.** Explosion proof electric outlet. **29.** Adjustable stool. **30.** Irrigator stand. **31.** Adjustable open shelving, 18 in. wide. **32.** Vision panel. **33.** Clock and interval timer. **34.** Double recessed view box. **35.** Aspirator below view box. **36.** Flush ceiling fixture for general illumination. **37.** Explosion proof calling station, foot operated. **38.** Corridor dome light.

28. Cystoscopic Room. **1.** Shelf. **2.** Sink in counter with gooseneck spout and knee control. **3.** Counter, 36 in. high, open below. **4.** Light-proof shade. **5.** Wall cabinet. **6.** Adjustable stool. **7.** Urological X-ray table. **8.** Ceiling light. **9.** Kick bucket. **10.** Wheeled catheter tray. **11.** Examining light. **12.** Electric cautery. **13.** Urological instrument cabinet, 19 by 30 in. **14.** Irrigator stand. **15.** Film hanger rack above counter. **16.** Safelight. **17.** Exhaust fan. **18.** Light proofed door with light proof louver. **19.** Ceiling light, white and red. **20.** Towel bar. **21.** Developing tank, 18 by 22 in. **22.** Film drying bracket for 12 films. **23.** Sink with shelf over. **24.** Timer. **25.** Waste paper receptacle. **26.** Counter, 36 in. high, with cabinets below. **27.** View panel. **28.** Double recessed view box. **29.** Footstool.

29. Fracture Room. **1.** Instrument table, 18 by 36 in. **2.** Galvanized iron can. **3.** Counter, 36 in. high, open below. **4.** Plaster sink. **5.** Plaster trap. **6.** Light proof shade. **7.** Fracture table. **8.** Footstool. **9.** Ceiling fixture. **10.** Double recessed view box. **11.** Linen hamper. **12.** Vision panel. **13.** Three shelves, 12 in. wide. **14.** Plaster drawer, 3 in. deep, open below. **15.** Adjustable stool with back. **16.** Plaster bin. **17.** Six shelves, 18 in. wide. **18.** Step ladder. **19.** Two rows of ¾ in. diameter dowels, 12 in. o.c., staggered; top row 6 ft. from floor; bottom row, 5 ft. from floor.

NOTE: Corridor doors should be light proofed.

30. Anesthesia Storage and Cleanup Room. **1.** Shelving 18 in. wide. **2.** Sink with gooseneck spout and knee or elbow control. **3.** Counter, 36 in. high, open below. **4.** Cabinet below counter, 2 ft. wide. **5.** Sanitary waste receptacle. **6.** Waste paper receptacle. **7.** Linen hamper. **8.** Double compartment laundry tray with drainboards. **9.** Wringer. **10.** Clinical sink. **11.** Vision panel. **12.** Dome light and buzzer set 5 ft. 6 in. from floor.

NOTE: Radiator to be omitted in Anesthesia Room.

31. Instrument and Sterile Supply Room, Surgical Supervisor and Recorder for a 200-Bed General Hospital. **1.** Step ladder. **2.** Shelving 18 in. wide. **3.** Instrument cabinet. **4.** Vision panel. **5.** Waste paper receptacle. **6.** Straight chair. **7.** Desk. **8.** Telephone outlet. **9.** Shelving 12 in. wide. **10.** Glazed door and partition, clear glass. **11.** Blackboard.

CENTRAL STERILIZING AND SUPPLY ROOMS, LOCKER ROOM

Legends: 32. Doctors' and Nurses' Locker Rooms in Surgical Suite. **1.** Mirror, 84 by 24 in., above counter. **2.** Counter, 30 in. high, open below. **3.** Stool, 18 in. high. **4.** Waste paper receptacle. **5.** Easy chair. **6.** Linen hamper. **7.** Bulletin board, 26 by 24 in. **8.** Lockers. **9.** Telephone outlet. **10.** Desk. **11.** Straight chair. **12.** End table. **13.** Instrument cabinets. **14.** Obscure glass.

33. Central Sterilizing and Supply Room for a 50-Bed General Hospital. **1.** Counter, 36 in. high, open below. **2.** Shelf. **3.** Sink and drainboard. **4.** Wall cabinet. **5.** Supply cart. **6.** Waste paper receptacle. **7.** Multiple rubber tube washer. **8.** Table, 42 by 72 in. **9.** Counter, 36 in. high, cabinets and drawers below. **10.** Dressing sterilizer, 24 by 24 by 36 in. **11.** Water still, capacity 5 gal. per hr. **12.** Ventilated mechanical space. **13.** Pass window. **14.** Telephone outlet. **15.** Desk. **16.** Step ladder. **17.** Sterile supply cabinets. **18.** Glove drying rack. **19.** Dutch door. **20.** Bulletin board, 26 by 24 in. **21.** Straight chair. **22.** Hot air sterilizer, 18 by 14 by 14 in. **23.** Floor drain.

NOTE: Convenient to this room provide a storage room for unsterile supplies and equipment.

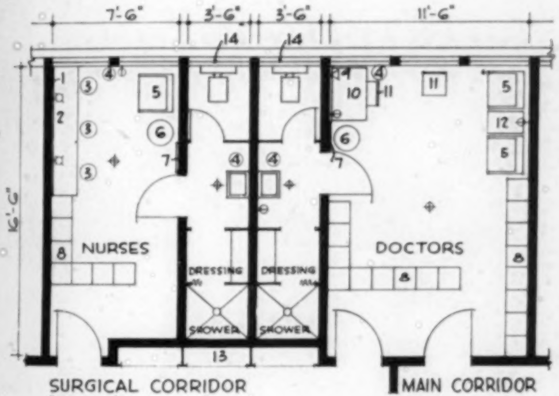
34. Central Sterilizing and Supply Room for a 100-Bed General Hospital. **1.** Counter, 36 in. high, open below. **2.** Shelf. **3.** Sink and drainboard. **4.** Wall cabinet. **5.** Supply cart. **6.** Waste paper receptacle. **7.** Multiple rubber tube washer. **8.** Table with shelf over, 42 by 96 in. **9.** Counter, 36 in. high, cabinets and drawers below. **10.** Dressing sterilizers; one, 24 by 24 by 36 in.; one, 20 by 36 in. **11.** Water still, capacity 5 gal. per hr. **12.** Ventilated mechanical space. **13.** Pass window. **14.** Telephone outlet. **15.** Built-in desk, 30 in. high with drawer. **16.** Step ladder. **17.** Sterile supply cabinet. **18.** Glove drying rack. **19.** Dutch door. **20.** Bulletin board, 26 by 24 in. **21.** Straight chair. **22.** Hot air sterilizer, 24 by 14 by 14 in. **23.** Floor drain. **24.** Dumbwaiter.

NOTE: Convenient to this room provide a storage room for unsterile supplies and equipment.

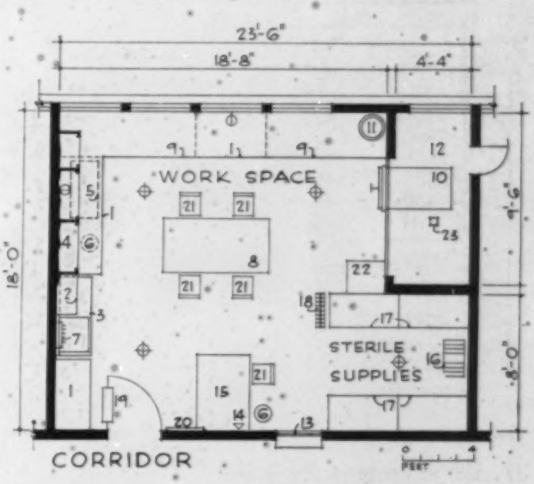
35. Central Sterilizing and Supply Room for a 200-Bed General Hospital. **1.** Counter, 36 in. high, open below. **2.** Shelf. **3.** Sink and drainboard. **4.** Wall cabinet. **5.** Supply cart. **6.** Waste paper receptacle. **7.** Multiple rubber tube washer. **8.** Table with shelf over, 42 by 96 in. **9.** Counter, 36 in. high, cabinets and drawers below. **10.** Dressing sterilizers; one, 24 by 36 by 48 in.; one, 24 by 24 by 36 in. **11.** Water still, capacity 5 gal. per hour. **12.** Ventilated mechanical space. **13.** Pass window. **14.** Telephone outlet. **15.** Desk. **16.** Step ladder. **17.** Sterile supply cabinet. **18.** Glove drying rack. **19.** Dutch door. **20.** Bulletin board, 26 by 24 in. **21.** Straight chair. **22.** Hot air sterilizer, 30 by 24 by 18 in. **23.** Floor drain. **24.** Dumbwaiter. **25.** Laundry chute. **26.** Glazed partitions. **27.** Adjustable stool.

NOTE: Convenient to this room provide a storage room for unsterile supplies and equipment.

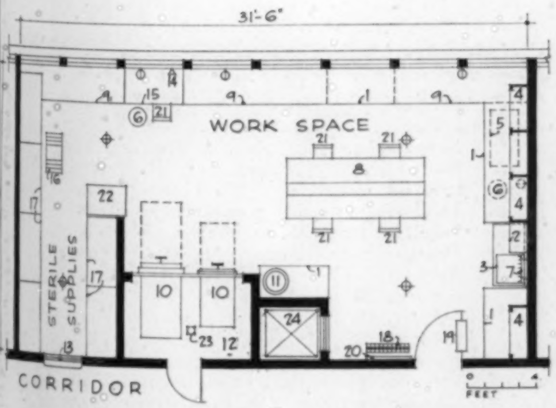
All of these recommended hospital elements are based on the plan of having central sterilizing and supply rooms, from which all departments are supplied. With supplies thus handled and sterilized there is considerable saving in equipment installations, as otherwise many departments would have duplicate facilities. There is also the possibility of high efficiency in having skilled personnel do all such work, with adequate equipment and adequate space. And the central room can use autoclaves



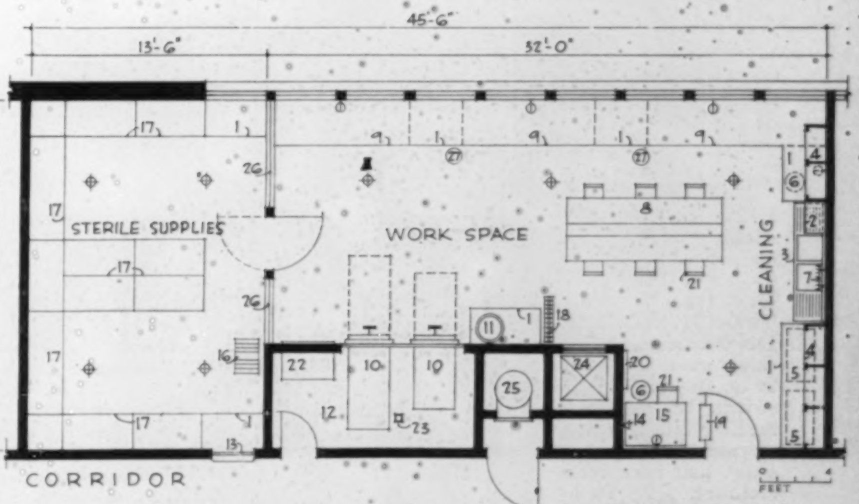
32. Doctors' and Nurses' Locker Rooms



33. Central Sterilizing and Supply Room for a 50-Bed General Hospital



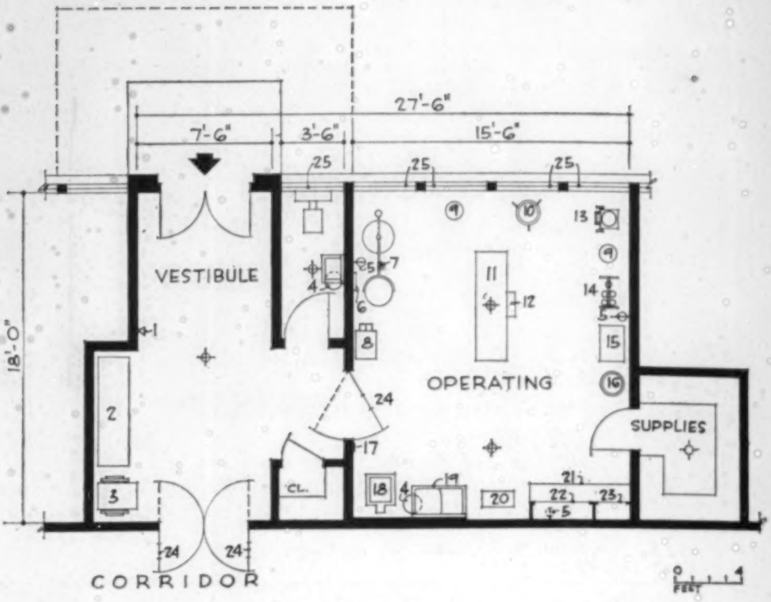
34. Central Sterilizing and Supply Room for a 100-Bed General Hospital



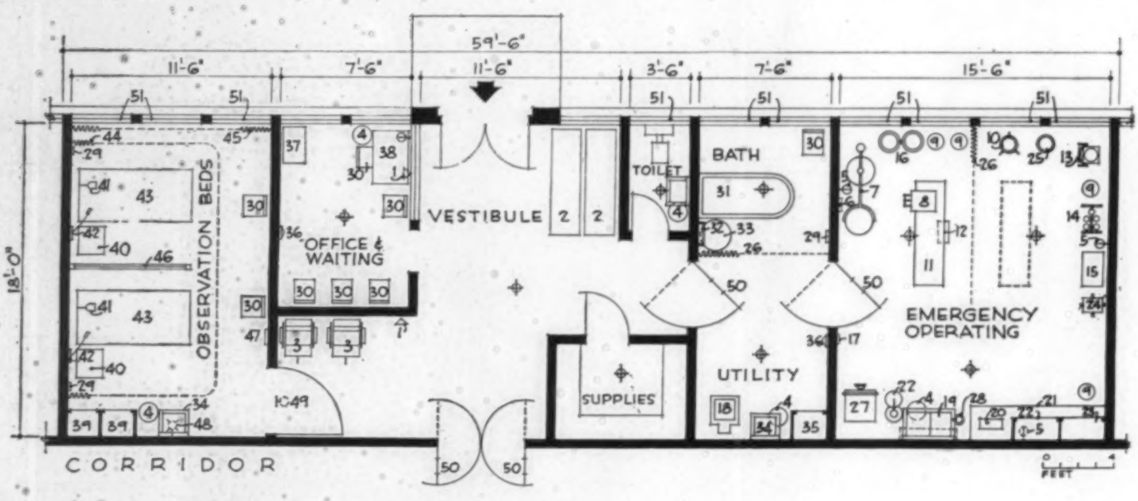
35. Central Sterilizing and Supply Room for a 200-Bed General Hospital

EMERGENCY SUITES

The emergency suite is one department which has no relation to the size of the hospital. The determining factor is simply the amount of emergency work the hospital is called upon to handle. The smaller one is considered a minimum department, and contains no beds at all. The plan at the top of the page shows something much more suitable for regular emergency department work; the hospital might well require still more facilities



36. Small Emergency Suite



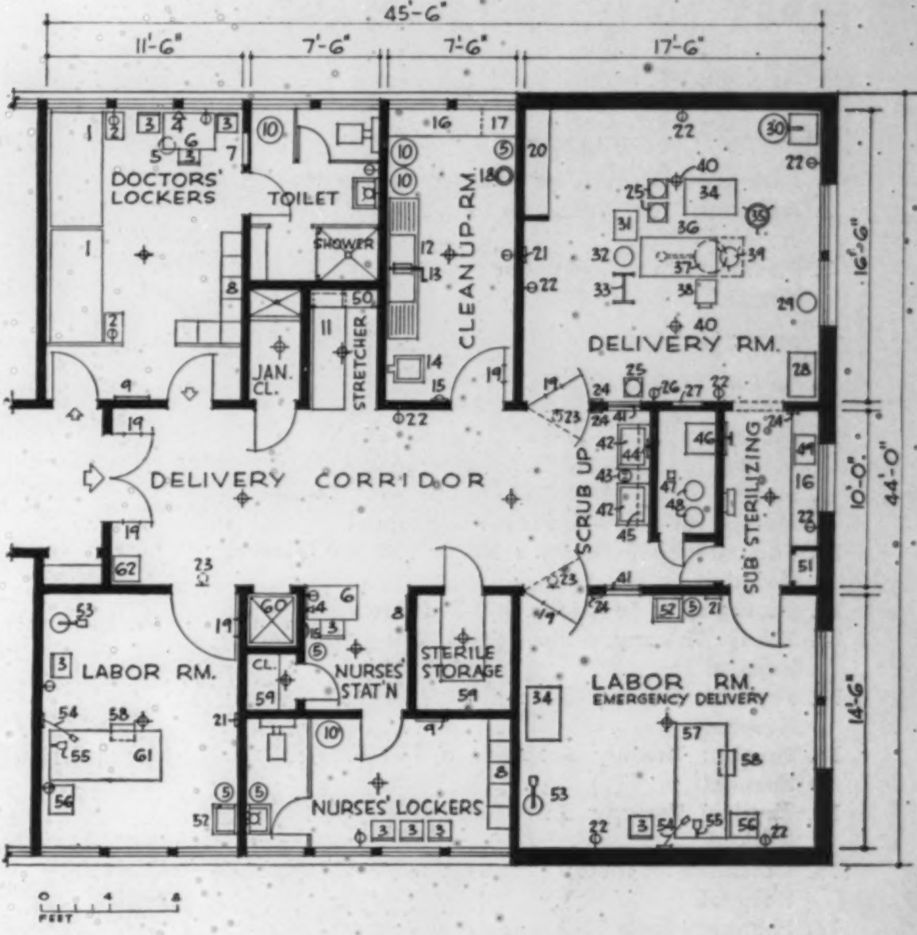
37. Large Emergency Suite

The observation beds in this larger emergency suite are for observation of patients who might not be admitted to the hospital; drunkards are a familiar variety. Office is for police officers. Double operating facilities for multiple cases like automobile accidents

Legends: 36. Small Emergency Suite. **1. Telephone outlet. 2. Wheel stretcher. 3. Wheel chair. 4. Waste paper receptacle. 5. Explosion proof outlet. 6. Clock. 7. Portable emergency light. 8. Mayo table. 9. Adjustable stool. 10. Kick bucket. 11. Examining table. 12. Footstool. 13. Resuscitating apparatus. 14. Anesthesia unit. 15. Instrument table, 16 by 24 in. 16. Single basin stand. 17. Mercury switch. 18. Clinical sink with bed pan flushing attachment. 19. Combination instrument and scrub sink with gooseneck spout and knee control. 20. Instrument sterilizer, 9 by 10 by 20 in., on stand. 21. Counter, 36 in. high with cabinets below. 22. Wall cabinet. 23. Locked wall cabinet with inner locked narcotic compartment and inside light. 24. Vision panel. 25. Obscure glass.**

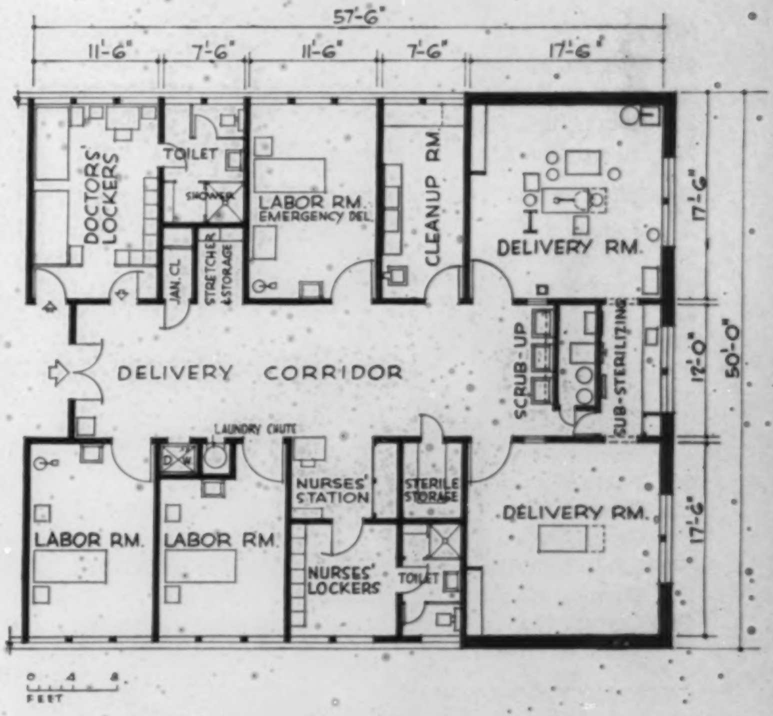
37. Large Emergency Suite. **1. Telephone outlet. 2. Wheel stretcher. 3. Wheel chair. 4. Waste paper receptacle. 5. Explosion proof outlet. 6. Clock. 7. Portable emergency light. 8. Mayo table. 9. Adjustable stool. 10. Kick bucket. 11. Examining table. 12. Footstool. 13. Resuscitating apparatus. 14. Anesthesia unit. 15. Instrument table, 16 by 24 in. 16. Double basin stand. 17. Mercury switch. 18. Clinical sink with bed pan flushing attachment. 19. Combination instrument and scrub sink with gooseneck spout and knee control. 20. Instrument sterilizer, 4 by 6 by 16 in. 21. Counter, 36 in. high with cabinets below. 22. Wall cabinet. 23. Locked wall cabinet with inner locked narcotic compartment and inside light. 24. Leg stand. 25. Sanitary waste receptacle. 26. Curtain and rod. 27. High speed pressure sterilizer, 16 by 24 in. 28. Single soap dispenser. 29. Hook strip. 30. Straight chair. 31. Shallow tub. 32. Towel bar. 33. Linen hamper. 34. Lavatory with gooseneck spout and knee control. 35. Blanket warmer. 36. Dome light and buzzer, set 5 ft. 6 in. from floor. 37. Filing cabinet, letter size, 4 drawers. 38. Desk. 39. Locker. 40. Bedside cabinet. 41. Bed light. 42. Nurses' calling station with duplex receptacle. 43. Adjustable hospital bed. 44. Cubicle curtain and rod. 45. Sliding window curtain. 46. Cubicle partition, 7 ft. high with obscure glass in upper panels. 47. Night light. 48. Wall bracket light, switch controlled. 49. Corridor dome light. 50. Vision panel. 51. Obscure glass.**

The obstetrical department is also a deadened unit, which should have the end location on a separate maternity floor. In the typical general hospital about 12 to 20 per cent of the patients will be maternity cases. And the rule is to provide one delivery room for each 20 maternity beds or less, regardless of the size of the hospital. Similarly one labor bed is provided for each 10 maternity beds, or two for each delivery suite. The delivery suite is very similar to a regular operating department. Here is shown the wide corridor, for the volume of traffic that might have to move swiftly. A dumbwaiter off this corridor, connecting with the central sterilizing and supply room, is a very handy appurtenance. The cots in the doctors' locker room are for those weary ones who must wait through the wee small hours for the stork to visit their patients


45'-6"
11'-6"
7'-6"
7'-6"
17'-6"
16'-6"
10'-0"
44'-0"
14'-6"
DOCTORS' LOCKERS
TOILET
SHOWER
JAN. CL.
STRETCHER
CLEANUP-RM.
DELIVERY RM.
DELIVERY CORRIDOR
SCRUB UP
SUB STERILIZING
LABOR RM.
CL.
NURSES' STAT'N
STERILE STORAGE
LABOR RM. EMERGENCY DELIVERY
NURSES' LOCKERS
0
4
8
FEET

38. Delivery Suite for a 100-Bed General Hospital

Legend: 38. Delivery Suite for a 100-Bed General Hospital. **1.** Combination box spring and mattress on legs. **2.** Night table. **3.** Straight chair. **4.** Telephone outlet. **5.** Waste paper receptacle. **6.** Table. **7.** Double recessed view box. **8.** Lockers. **9.** Bulletin board, 26 by 24 in. **10.** Linen hamper. **11.** Wheel stretcher. **12.** Double compartment laundry tray with drainboards. **13.** Wringer. **14.** Clinical sink with bed pan flushing attachment. **15.** Dome light and buzzer set 5 ft. 6 in. from floor. **16.** Counter 36 in. high, open below. **17.** Cabinet below counter, 2 ft. wide. **18.** Sanitary waste receptacle. **19.** Vision panel. **20.** Adjustable open shelving, 18 in. wide. **21.** Clock with sweep second hand. **22.** Explosion proof outlet. **23.** Corridor dome light. **24.** Mercury switch. **25.** Single basin stand. **26.** Explosion proof calling station, foot operated. **27.** Aspirator. **28.** Heated bassinet. **29.** Adjustable stool. **30.** Portable emergency light. **31.** Anesthetist's table. **32.** Anesthetist's stool. **33.** Anesthesia unit. **34.** Instrument table. **35.** Kick bucket. **36.** Delivery table. **37.** Obstetrical light. **38.** Mayo table. **39.** Kick basin. **40.** Flush ceiling fixture for general illumination. **41.** View window, clear glass. **42.** Scrub sink. **43.** Soap dispenser. **44.** Clock. **45.** Shelf over scrub sinks. **46.** High speed pressure sterilizer, 16 by 24 in. **47.** Floor drain. **48.** Water sterilizers, 15 gal. ea. **49.** Sink in counter. **50.** Wall cabinet set 42 in. from floor. **51.** Blanket and solution warmer. **52.** Lavatory with gooseneck spout and knee control. **53.** Examining light. **54.** Nurses' calling station with duplex receptacle. **55.** Bed light. **56.** Bedside cabinet. **57.** Obstetrical bed. **58.** Footstool. **59.** Shelving. **60.** Dumbwaiter connecting with central sterilizing room. **61.** Labor bed. **62.** Water cooler.


57'-6"
11'-6"
7'-6"
11'-6"
7'-6"
17'-6"
17'-6"
12'-0"
50'-0"
17'-6"
DOCTORS' LOCKERS
TOILET
SHOWER
JAN. CL.
STRETCHER & STORAGE
LABOR RM. EMERGENCY DEL.
CLEANUP RM.
DELIVERY RM.
DELIVERY CORRIDOR
SCRUB-UP
SUB-STERILIZING
LAUNDRY CHUTE
NURSES' STATION
STERILE STORAGE
LABOR RM.
LABOR RM.
NURSES' LOCKERS
TOILET
DELIVERY RM.
0
4
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FEET

39. Delivery Suite for a 200-Bed General Hospital

Note the change of scale here — though this suite appears smaller, actually it is the larger one. Equipment would be the same as in the suite in the top plan; the major addition is a third labor room

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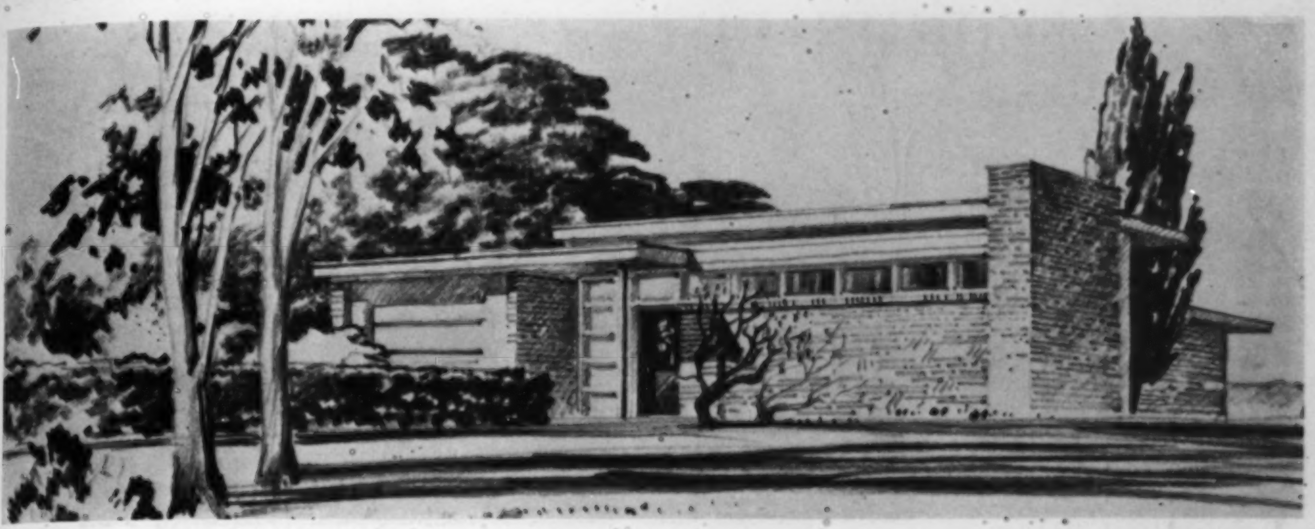


SIX VETERANS ADOPT A BASIC PLAN

FOR THEIR HOMES IN ST. LOUIS, MISSOURI

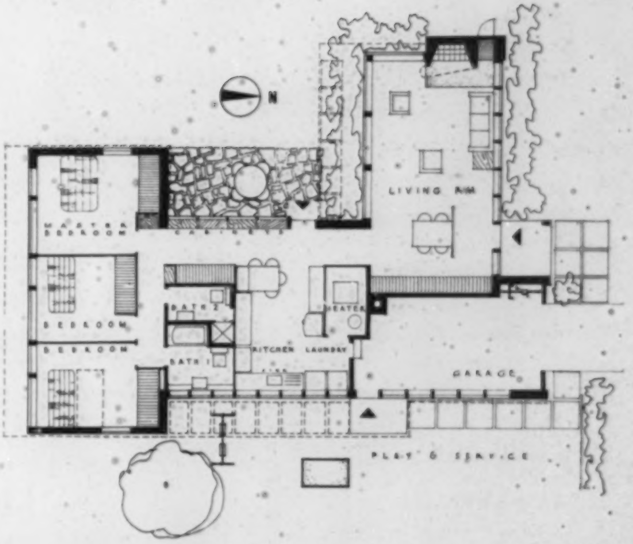
Joseph Dennis Murphy, Architect

Seldom would a single plan suit six different owners and six sites, but six veterans, all graduates of Washington University, acquired a strip of land on which all lots adjoin and naturally have the same orientation. This simplified one architect's problem and through an extensive survey of individual family needs and desires he was able to develop a functional and efficient basic plan to suit all six families.

The kitchen, in which the housewife must spend much time, was made the center of the plan, placed to overlook a terrace on which children can play under a mother's watchful eye. There is direct access from the kitchen to the garage which is placed conveniently at the north front of the house. The kitchen itself is ample and airy, having windows on two sides, and dining is provided for in the kitchen, but can be conveniently arranged in the living room or on the terrace, as the season or occasion may demand.

The living room has high windows to the north, but is open to the sunshine to the south, with windows from floor to ceiling, and it also overlooks the play terrace, shielding it from the street. One wall of the living room is entirely devoted to storage and closet space, and the high north windows allow plenty of wall space for furniture.

The bedrooms are placed at the south for quiet and for sunshine, and two baths are insurance against early morning congestion. Large closet space is provided most conveniently, fully equipped with storage facilities and sliding panel doors.



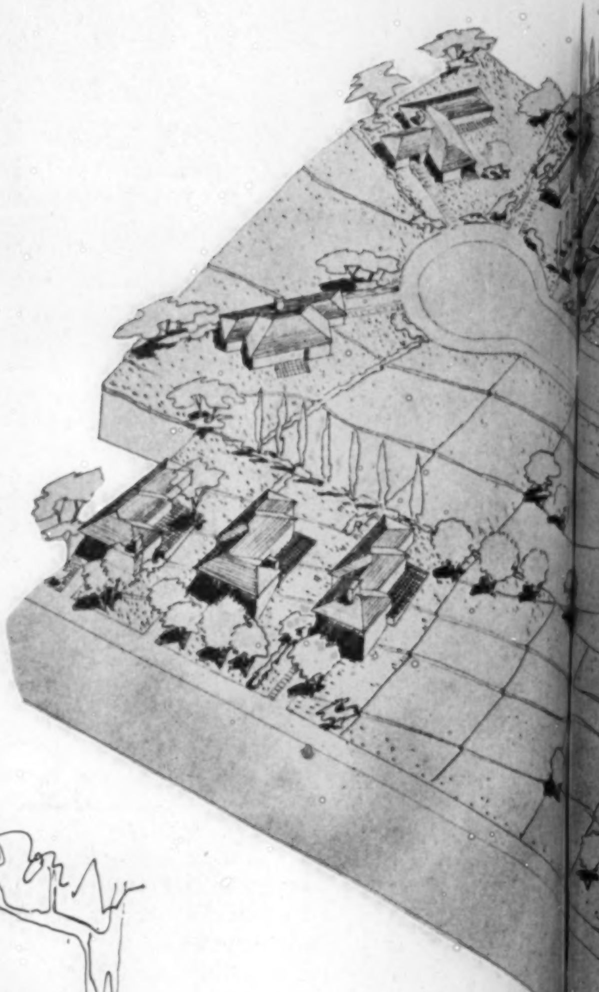
There is no basement and the concrete floor is equipped with radiant heating. Since the houses are of brick, with large glass areas, a minimum of lumber is necessary in the construction. Concentrated plumbing also saves scarce material. Economy and convenience spell true functionalism in the homes of these 6 families.

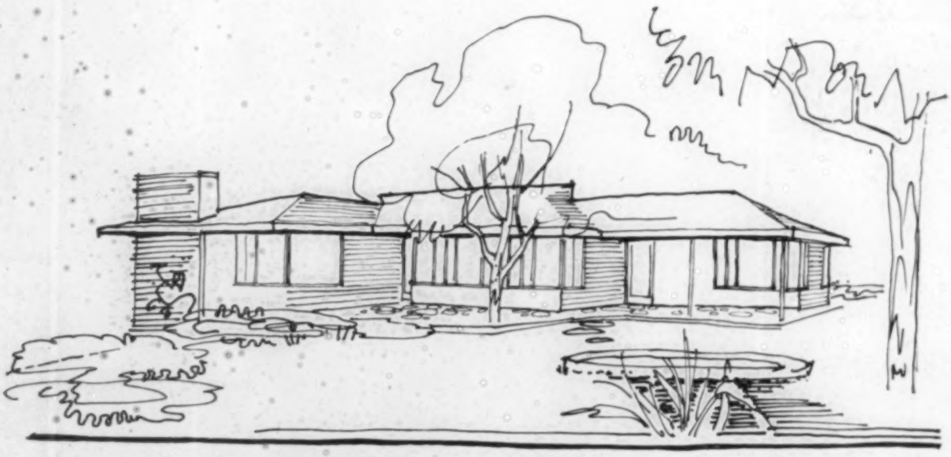
CO-OP SCHEME CUTS HOUSE COSTS

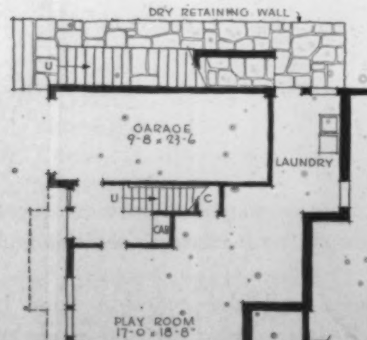
Sunlight Knolls Project, Yonkers, N. Y. **Pomerance & Breines, Architects**

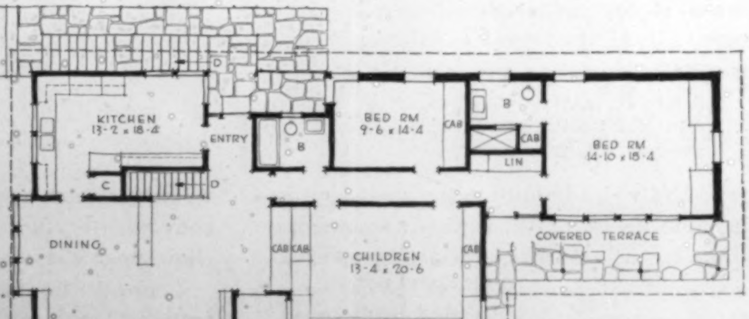
WITH the so-called Wyatt program now dominating the small house field, the age-old problem of architectural services for small houses rears up again in still more serious form. Architects — and their clients — might find something interesting in the current experience of Pomerance & Breines in this cooperative project. Perhaps cooperative is not exactly the right word; "group action" might be better. Each owner bought his own lot after the site plan was worked out. The same architects (the same builders, too) did all the houses together; that's the important cooperation. Or maybe it's more important that in such an operation the architects were able to find a saving of something like 10 per cent, which is rather a significant figure in small houses.

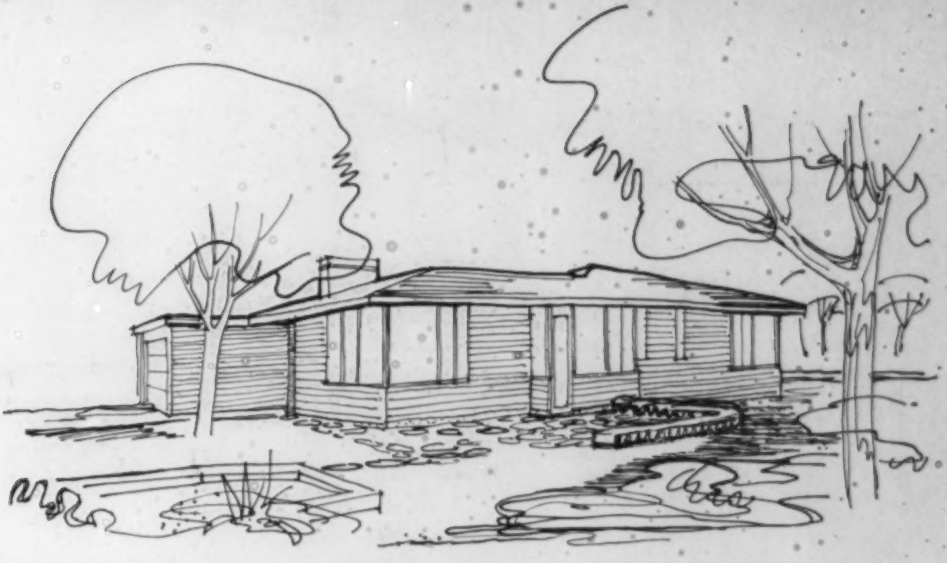
Individual design service was given on each house; each client got a complete custom design. There is, of course, the obvious benefit of fitting each one into the group project, which should be well worth the cost of architectural services even without monetary savings. But there were savings in group purchasing, in similar detailing to a certain extent, and in contractors' charges.

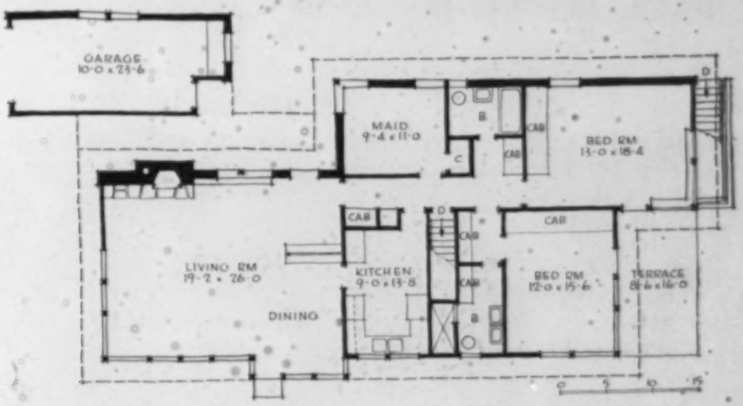





DRY RETAINING WALL
U
GARAGE 9-8 x 23-6
LAUNDRY
U
C
CAB
PLAY ROOM 17-0 x 18-8
T
HEATER
GROUND FLOOR
0 5 10 15

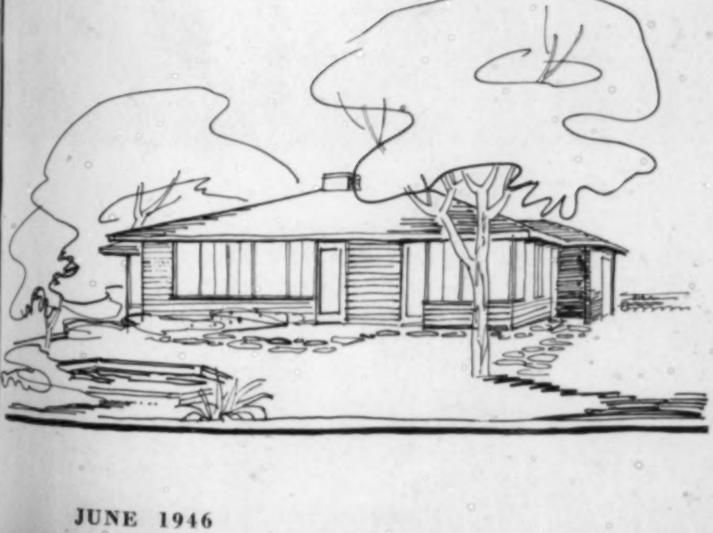

KITCHEN 13-2 x 18-4
ENTRY
C
B
BED RM 9-6 x 14-4
CAB
B
CAB
LIN
BED RM 14-10 x 18-4
DINING
CAB CAB
CHILDREN 13-4 x 20-6
CAB
COVERED TERRACE
LIVING RM 21-4 x 27-8
OPEN TERRACE
FIRST FLOOR

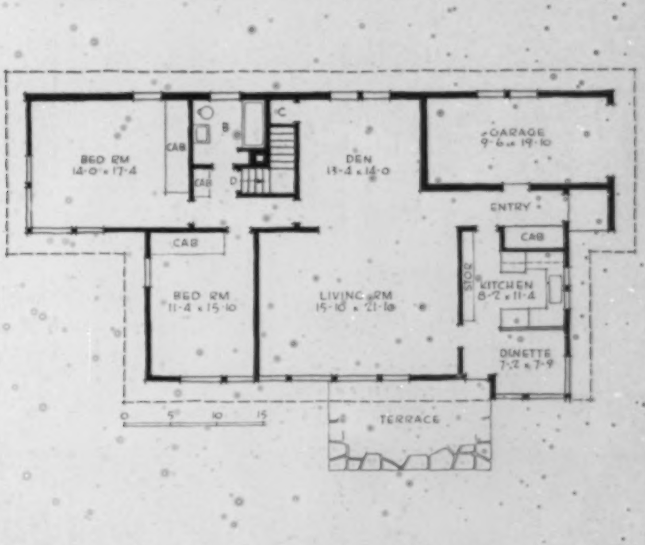


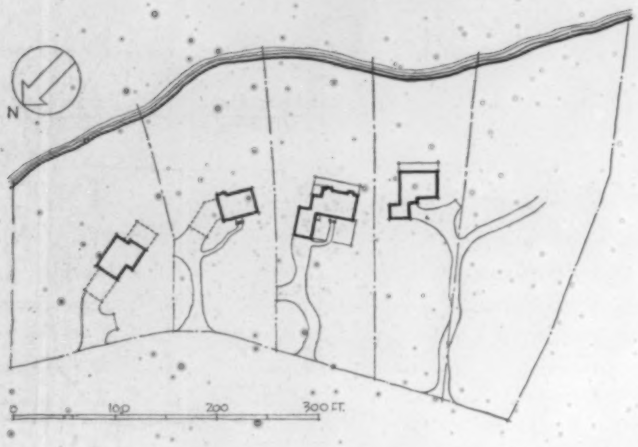

GARAGE
10-0 x 23-6
MAID
9-4 x 11-0
B
C
CAB
CAB
BED RM
13-0 x 18-4
D
CAB
D
CAB
CAB
LIVING RM
19-2 x 26-0
KITCHEN
9-0 x 13-8
BED RM
12-0 x 15-6
TERRACE
8-6 x 16-0
DINING
B
0
5
10
15

Prefabricated closet-walls were used, for example. And aluminum windows, purchased together, came out well in the cost figures. A similar truss is used in each house. This started because of the specification of ceiling panel heating, with copper tubing coils. The truss, with a catwalk arrangement, makes an ideal method of hanging tubing. And, this being available, water piping was similarly suspended; it was not necessary then to break the solid slab floors with pipe trenches.

Not all of the houses are going forward right now. There will be ten in the first group (ten owners being veterans), and six to follow later. The pitched roofs, incidentally, were demanded by deed restrictions.




BED RM
14-0 x 17-4
CAB
CAB
B
C
D
DEN
13-4 x 14-0
GARAGE
9-6 x 19-10
ENTRY
CAB
CAB
BED RM
11-4 x 15-10
LIVING RM
15-10 x 21-10
STOR
KITCHEN
8-2 x 11-4
DINETTE
7-2 x 7-9
0
5
10
15
TERRACE



Cooperation pays in small project, for four M. I. T. professors at Winchester, Mass.
David J. Abrahams and Associates, Architects

FOUR HOUSES IN GROUP EFFORT

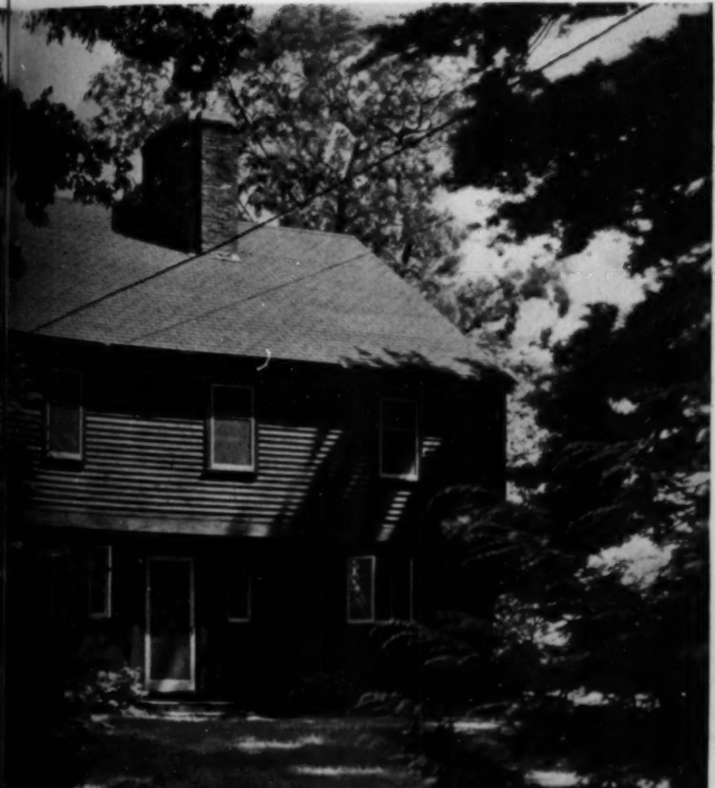
That group action in building houses pays even in small projects is shown by the experience of four professors at M. I. T., who found many satisfactions and several economies in building their own houses. The cooperation began quite naturally in casual conversations, grew into a positive effort by more than a dozen families. These four dissented when the others bought another site, then got together again when they grew fond of this site and managed to make a fortunate purchase. The same architect did all the houses; the same builder erected three of them. Aside from the many benefits of group planning, the owners found many human satisfactions and not a few economies in working together over landscaping projects, pipe trenches, and so on.

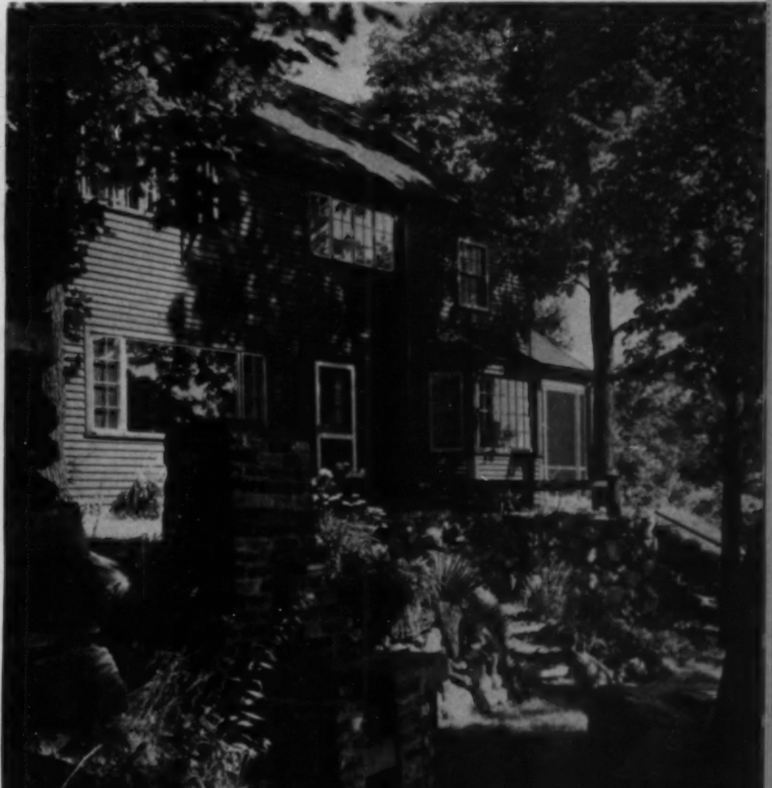
HASKELL Photos

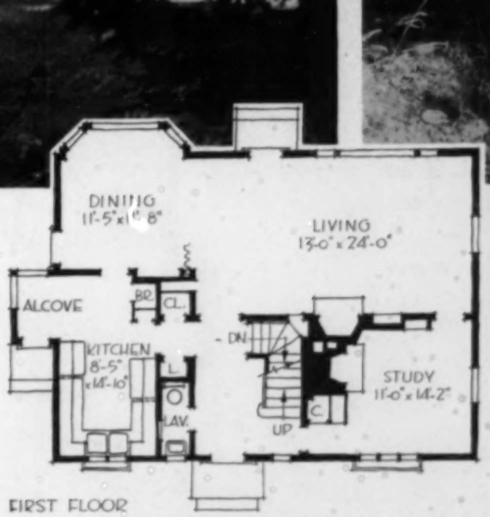
The site is a wooded hillside overlooking Mystic Lake, an estate bought and divided by the group. The owner's interest in their project, it is said, was a factor in their securing a favorable price; and their determination to build in traditional styles was one of the factors responsible for his benevolent helpfulness!

1. FOR MR. & MRS. GERALD B. TALLMAN

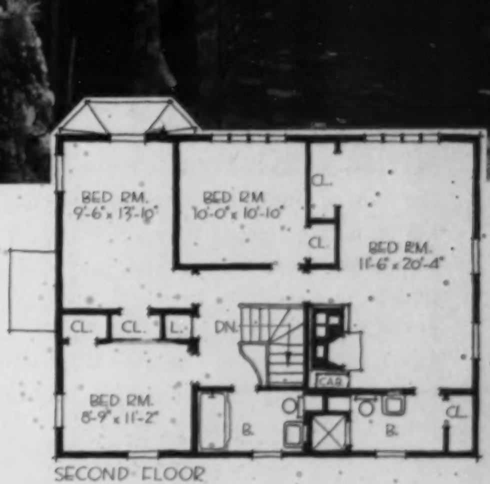
The Tallmans felt a "Garrison Colonial" best fitted to their typical New England site with its hemlock grove, and, incidentally, best calculated to give maximum space at minimum cost. The front has conventional windows toward the street, but large glass areas toward the lake. Space under the steep roof is developed for storage; over the garage will be a future bedroom and bath. The architect angled the double garage slightly away from the street to keep the doors from being too dominant.



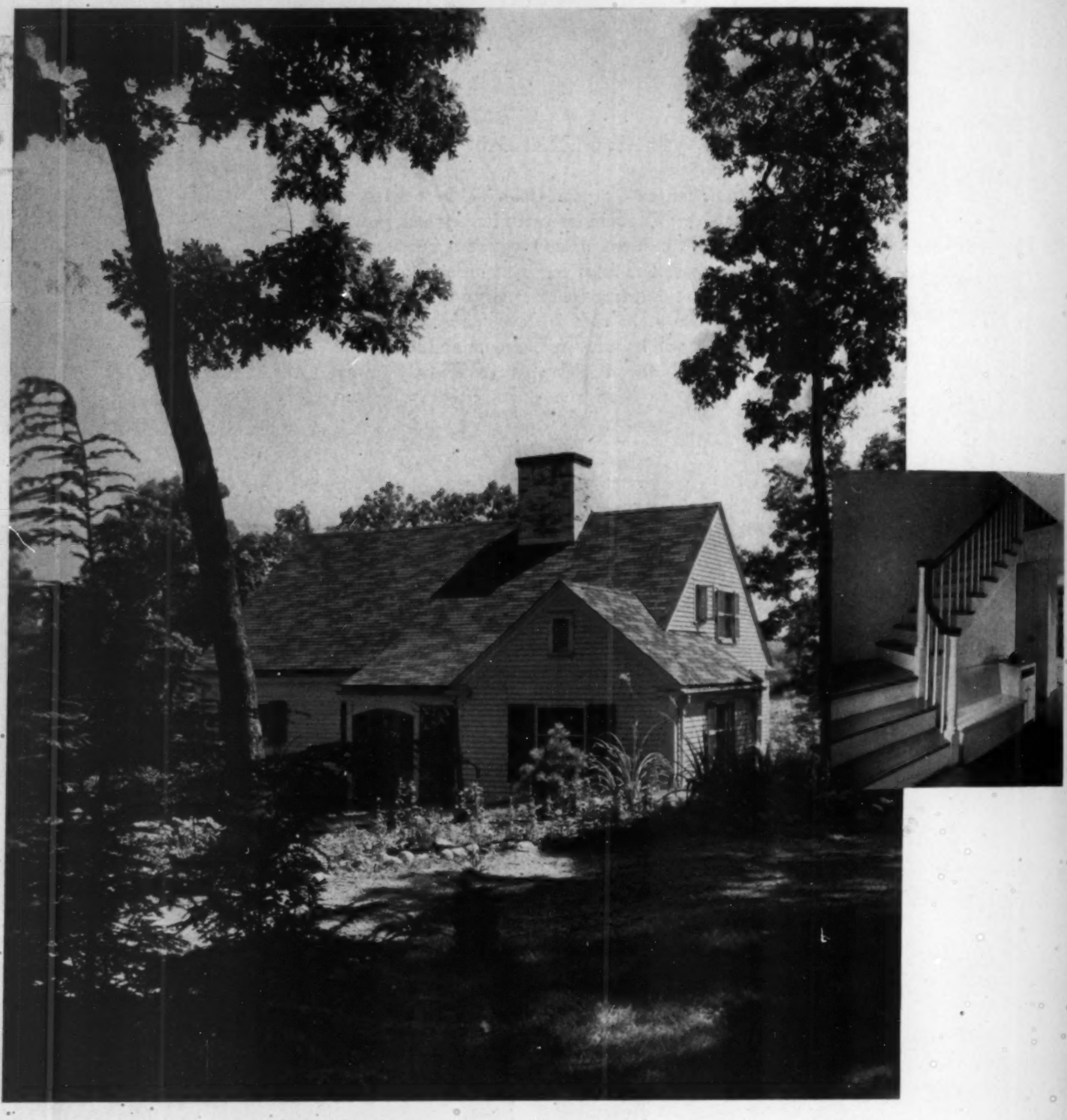



DINING
11'-5"x11'-8"
LIVING
13'-0" x 24'-0"
ALCOVE
BR
CL.
KITCHEN
8'-5"
x 14'-10"
DN
L
LAV.
UP
C
STUDY
11'-0" x 14'-2"

FIRST FLOOR

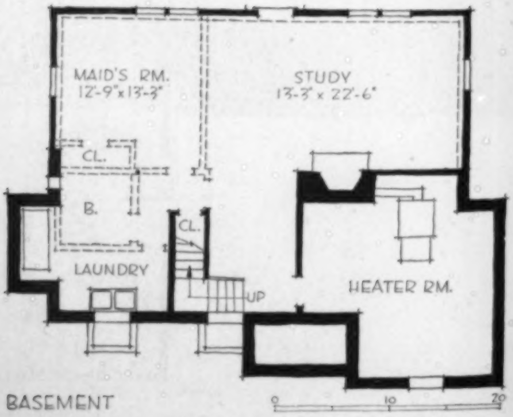

BED RM.
9'-6" x 13'-10"
BED RM
10'-0" x 10'-10"
CL.
CL.
BED RM.
11'-6" x 20'-4"
CL.
CL.
L.
DN.
CAB
BED RM.
8'-9" x 11'-2"
B.
B.
CL.

SECOND FLOOR

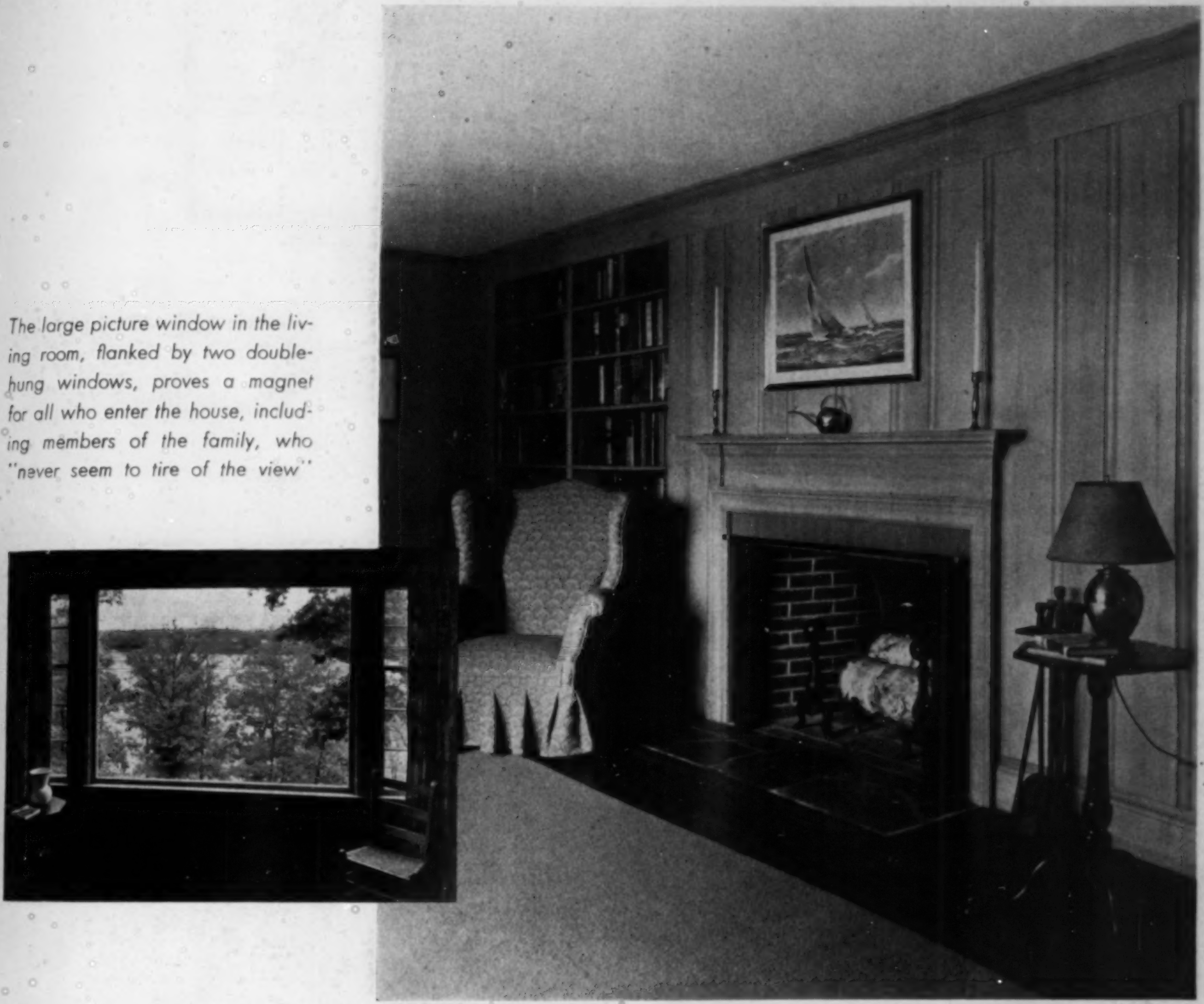


2. FOR MR. AND MRS. ALBERT DIETZ

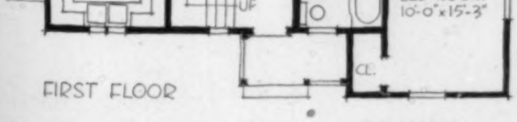
Because the owner of this house teaches at M. I. T. in the field of building engineering he has frequently been asked why he wanted the services of an architect. It was precisely because, he explains, he has seen so many houses designed by non-architects fail to achieve the grace, pleasing proportions and deft detail that only long experience can give. The plan itself was largely done by the Dietzes, but they were content to leave detailing and proportioning to their architect.

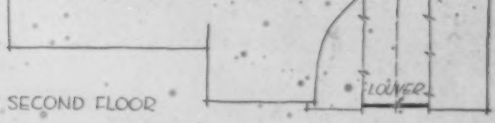

MAID'S RM.
12'-9"x13'-3"
STUDY
13'-3" x 22'-6"
CL.
B.
CL.
LAUNDRY
UP
HEATER RM.
BASEMENT
0
10
20

The large picture window in the living room, flanked by two double-hung windows, proves a magnet for all who enter the house, including members of the family, who "never seem to tire of the view"



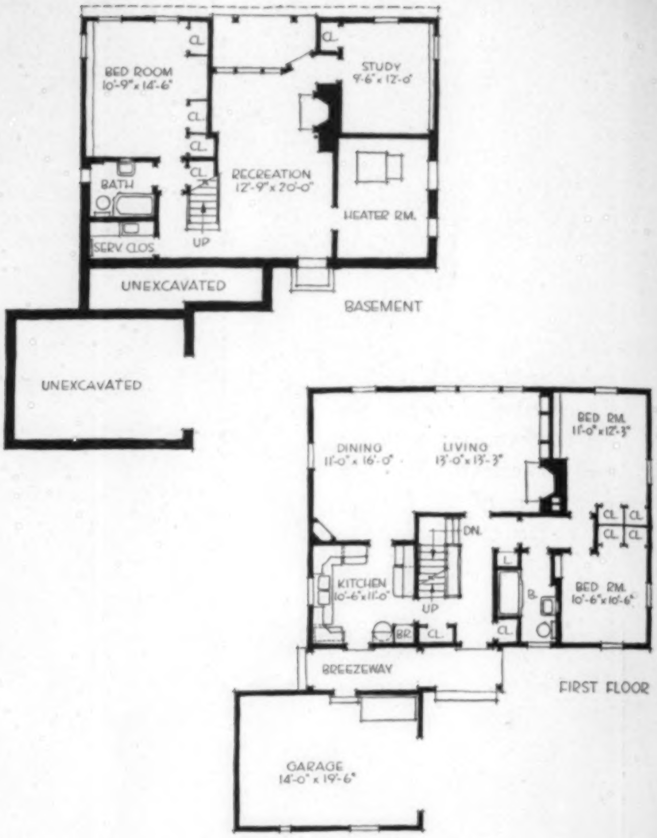
Orientation made it inevitable that principal rooms should be on the lake side. With some trepidation the owners decided to combine living and dining rooms into one large area running the length of the house. The arrangement has proved "completely satisfactory, especially when large groups have been entertained." Living-dining area here does not become a highway to other rooms


DINING
11'-6"x13'-6"
LIVING
13'-2" x 21'-10"
BR.
CL.
CL.
CL.
CL.
KITCHEN
10'-0"x14'-0"
DN.
UP
B.
L.
BED ROOM
10'-0"x15'-3"
CL.
FIRST FLOOR


CL.
BED ROOM
11'-0" x 12'-6"
BED ROOM
11'-0" x 15'-0"
BATH
DN.
CL.
CL.
STORAGE
LOUVER
SECOND FLOOR

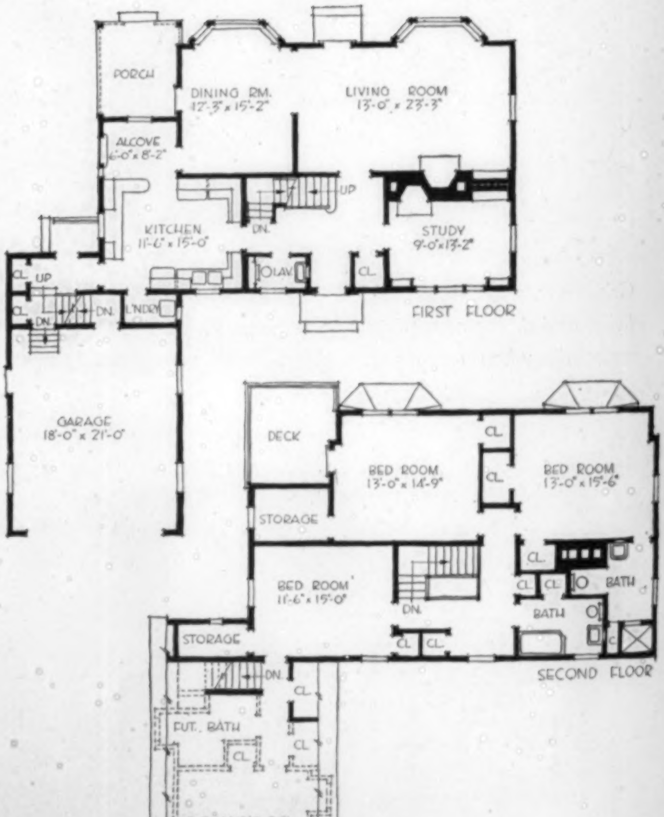
3. FOR MR. AND MRS. M. S. McILROY

The McIlroys wanted proximity to the lake, a large front yard, and quiet. They made an extensive survey with an electronic noise-level meter, and found an important diminution of noise below the crest of the slope. Advantage is taken of this fact by placing study and guest bedroom on the lower level; thus the house becomes a cottage as seen from the road, but has two useable stories facing the lake.


BED ROOM
10'-9" x 14'-6"
CL.
CL.
CL.
CL.
STUDY
9'-6" x 12'-0"
BATH
RECREATION
12'-9" x 20'-0"
HEATER RM.
SERV CLOS
UP
UNEXCAVATED
BASEMENT
UNEXCAVATED
DINING
11'-0" x 16'-0"
LIVING
13'-0" x 13'-3"
BED RM.
11'-0" x 12'-3"
CL
CL
CL
CL
DN.
KITCHEN
10'-6" x 11'-0"
UP
L
B.
BED RM.
10'-6" x 10'-6"
BR
CL.
CL.
BREEZEWAY
FIRST FLOOR
GARAGE
14'-0" x 19'-6"

4. FOR MR. AND MRS. R. H. ROBNETT

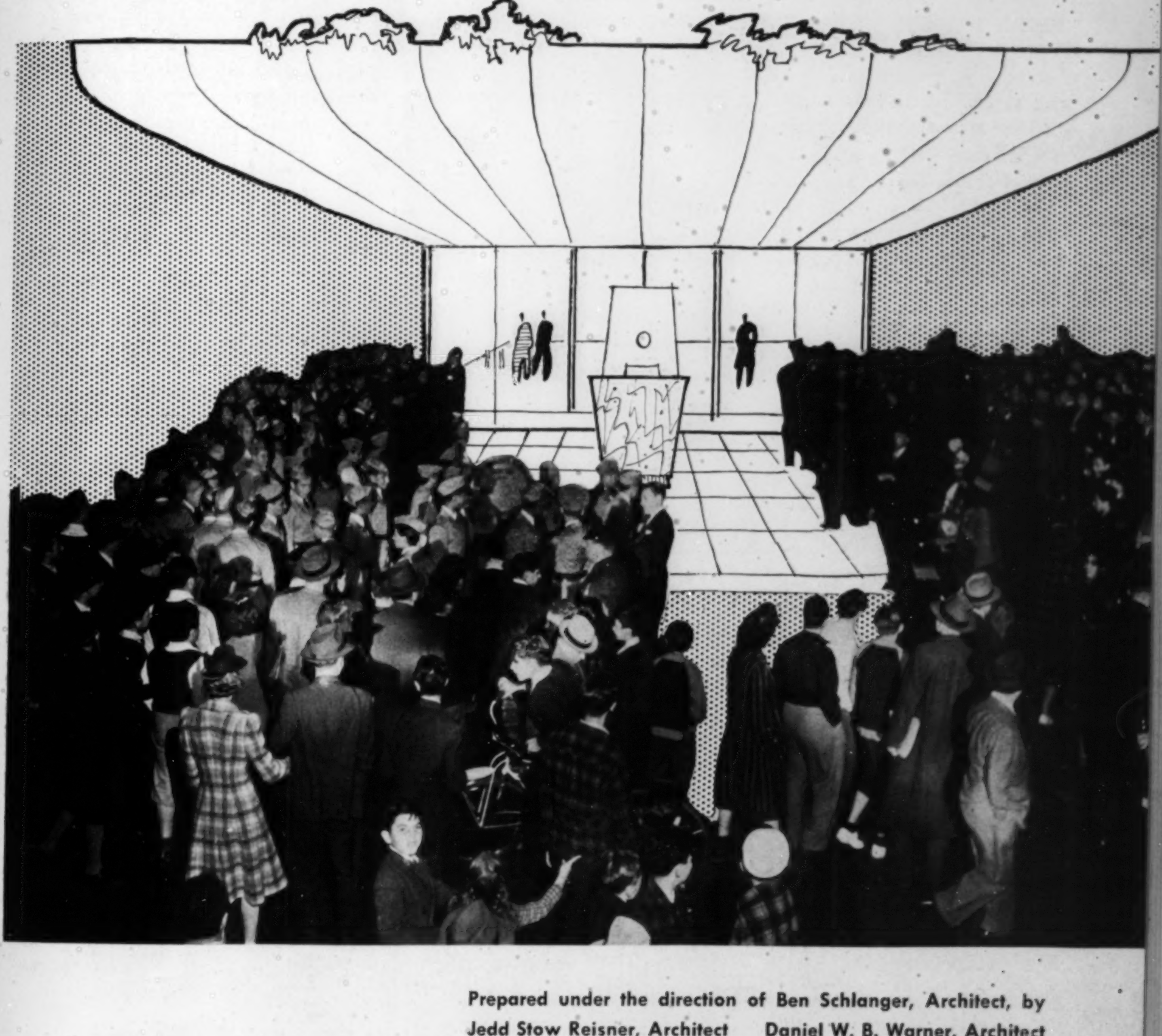
The Robnett house is the only one not featuring a picture window toward the lake. Two matching bay windows, glass door to porch, and the half-wall between dining and living rooms were worked out to give a view from any point in both rooms. The large kitchen has worked out to good advantage; the normal work space is compact, but there is extra space for many people to help with informal entertaining.


PORCH
DINING RM.
12'-3" x 15'-2"
LIVING ROOM
13'-0" x 23'-3"
ALCOVE
6'-0" x 8'-2"
UP
KITCHEN
11'-6" x 15'-0"
DN.
STUDY
9'-0" x 13'-2"
CL.
UP
LAV.
CL.
CL.
DN.
DN.
L'NDRY
FIRST FLOOR
GARAGE
18'-0" x 21'-0"
DECK
CL.
BED ROOM
13'-0" x 14'-9"
CL.
BED ROOM
13'-0" x 15'-6"
STORAGE
CL.
BED ROOM
11'-6" x 15'-0"
CL
CL
BATH
DN.
BATH
STORAGE
CL
CL
DN.
CL.
SECOND FLOOR
FUT. BATH
CL.
CL.
FUT. MAID'S RM.

Architectural Record's Building Types Study Number 114

Prepared in collaboration with Motion Picture Herald — Better Theatres

THE SMALL MOTION PICTURE THEATER (400 Seats)

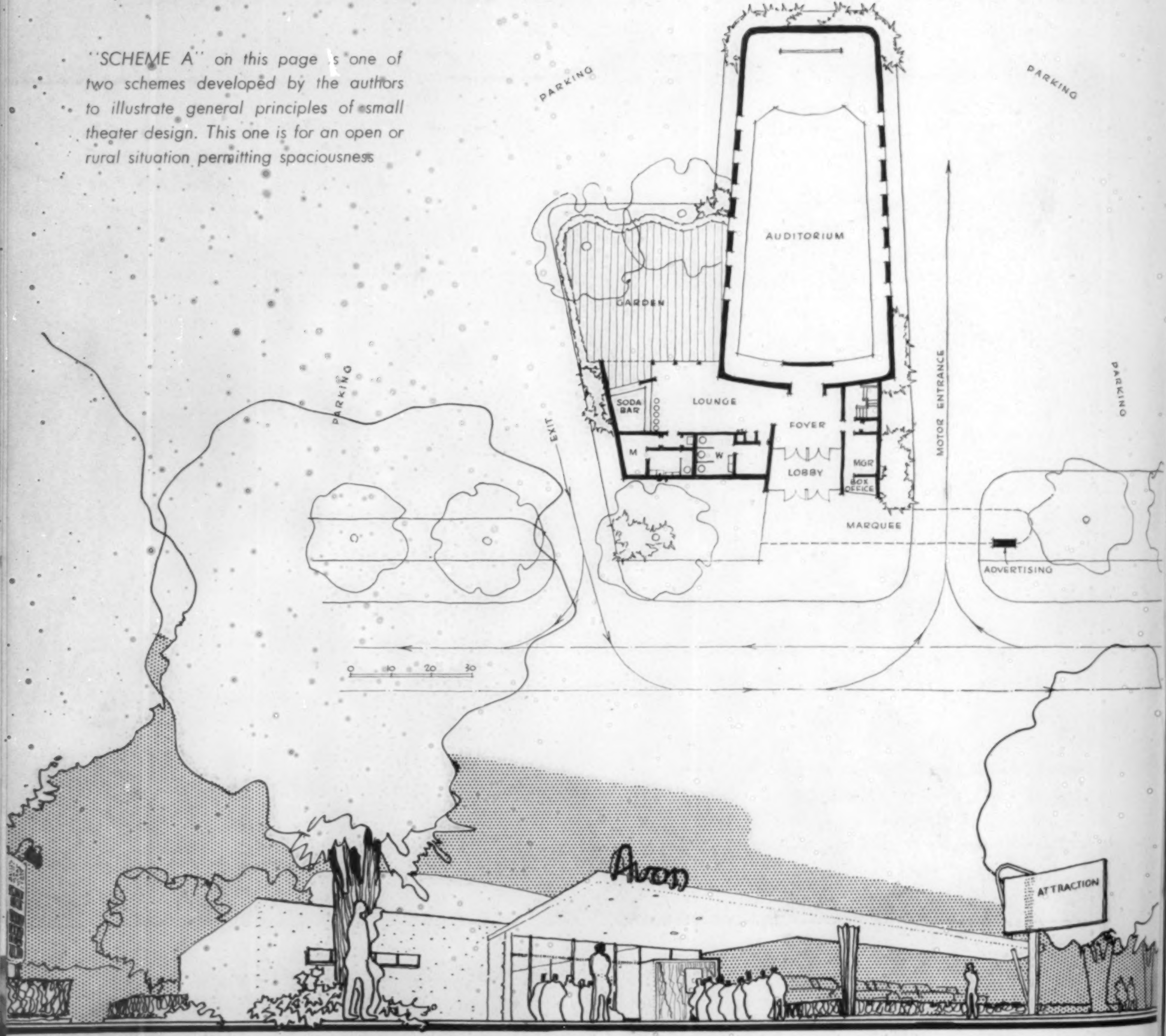


Prepared under the direction of Ben Schlanger, Architect, by
Jedd Stow Reisner, Architect Daniel W. B. Warner, Architect
Max O. Urbahn, Architect
Edward Content, Acoustical Engineer
William A. Hoffberg, Engineer
Frederick E. Sutton, Mechanical Engineer

with an article on the small theater budget by Chester Friedman, editor of the Managers' Round Table Department of Motion Picture Herald

THE SMALL MOTION PICTURE THEATER (400 Seats)

"SCHEME A" on this page is one of two schemes developed by the authors to illustrate general principles of small theater design. This one is for an open or rural situation permitting spaciousness


PARKING
PARKING
AUDITORIUM
GARDEN
PARKING
PARKING
SODA BAR
LOUNGE
FOYER
EXIT
MOTOR ENTRANCE
M
W
LOBBY
MGR
BOX OFFICE
MARQUEE
ADVERTISING
0 10 20 30
Avon
ATTRACTION

Salient features are: the "Continental" auditorium, having widely spaced rows of seats, with side-aisles only, and plenty of exits; the lounge and soda bar opening to a garden; large parking areas; over-all attractiveness used as "exploitation" instead of blaring lights

THE TYPICAL BUDGET*

To the architect fresh in this field, there are quite a few puzzles in the rather irrational arrangements that govern theaters. A few preliminary remarks may help to orient him in regard to the main headaches of the owner.

Theater gross income depends, of course, on how many admissions can be sold at how high a price. It is generally assumed that a theater, in order to earn a profit, must make total average daily sales equal to its seating capacity. In other words, a 400-seat theater should sell an average of 400 admissions a day. Whether there will really be a profit depends on how high a price can be charged. This depends on (a) the "draw" (the potential of the neighborhood in terms of population density, incomes, radius of appeal, competition, etc.) and (b) the "available product" or quality and timing of films. Factors relating to neighborhoods and the "draw" are discussed more fully in AR, June, 1944, pages 83–102. The question of available product is complex; basically the problem is whether the owner can obtain product of comparable quality early enough in comparison with his rivals. Admission prices in the new theater are normally less, in a few cases the same, rarely higher than those obtaining among established competitors.

The gross income, then, is estimated by multiplying the seating capacity by the number of days in the year and by the admission price obtainable.

Against this there is an expense budget, in which the cost of "product" or film is the principal item, exceeding the item of building rent. The leading film distributors in the United States anticipate collecting from 30 to 45 per cent of the theater gross for their product. The film

(Continued on page 107)

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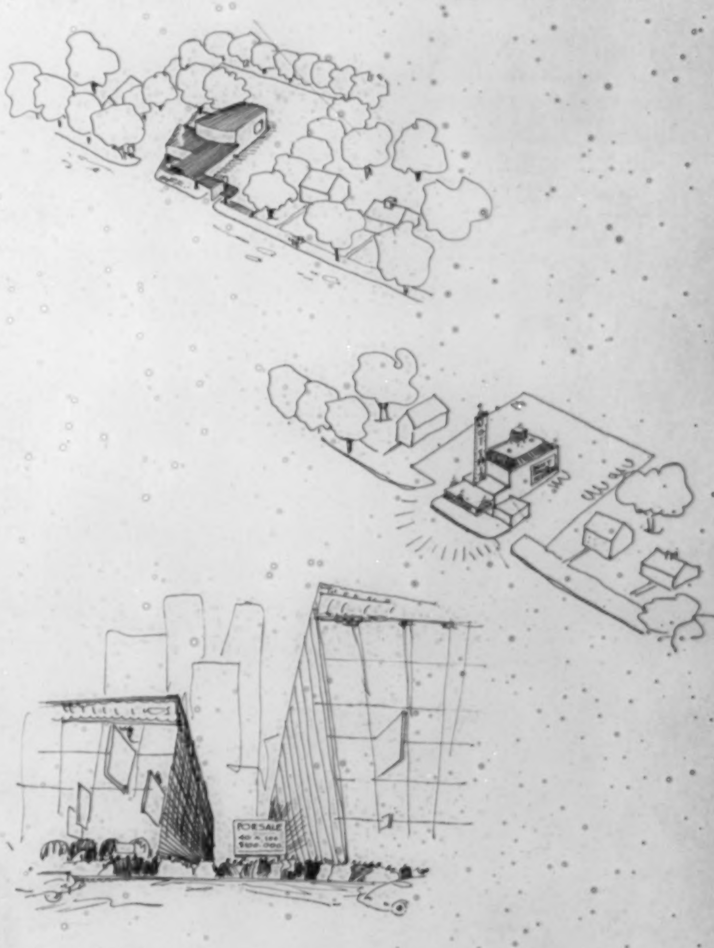
* Contributed by Chester Friedman, Editor of Managers' Round Table Department, Motion Picture Herald.

SITE DEVELOPMENT

Commercial districts are divided into narrow deep lots suitable for stores. Site planning is, therefore, a matter of the owner's financial ability to assemble a parcel of lots. The 400-seat theater developed in scheme B (overleaf) can be built on a 40 ft. lot. If there is an alley at the rear (as we have assumed) then an interior lot is suitable, otherwise a corner lot is necessary. Note that an exit court must be provided whether the plot is interior or on a corner since most codes preclude the obstruction of sidewalks with exterior stairs and the old fashioned fire escape is discouraged.

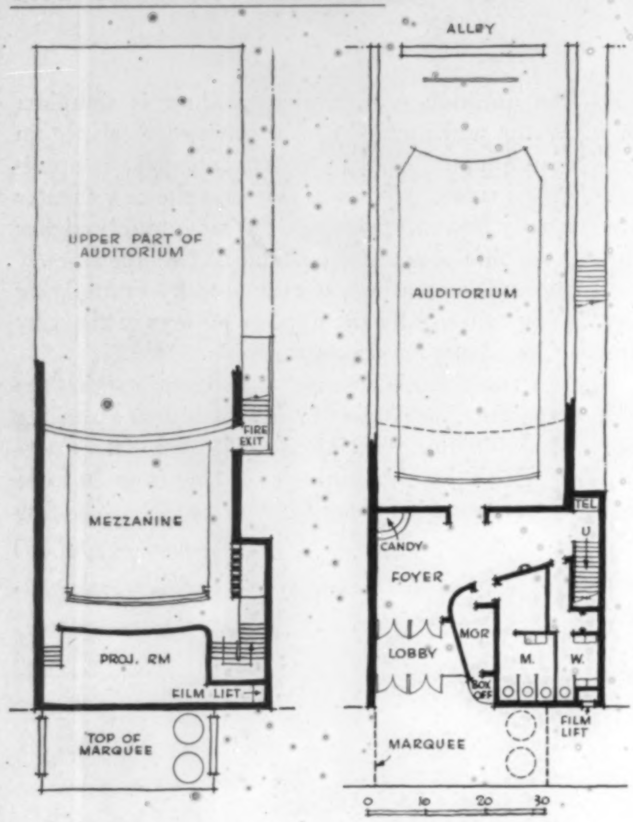
A more pleasant problem is the small movie theater built as a free-standing unit of a planned shopping center or as a separate enterprise in a suburban semi-commercial zone (scheme shown across page). Here the building is visible from many angles and must be considered as a whole design. Lower land costs permit a more generous and more adaptable site. Proper attention must be paid to facilities for parking since a large proportion of the patronage will come from the trade of the far-ranging motorist. The site may be planned to include such income-producing amenities as a day nursery to care for children during parents' attendance at the movie and refreshment gardens. The parking lot can be arranged so that a fee can be charged for parking at certain hours of the day in order to accommodate shoppers in the neighborhood.

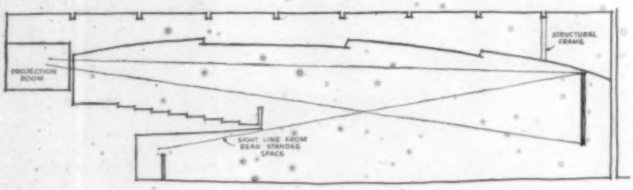
The suburban householder is accustomed to think of the movie house as a large brick hulk covering 100 per cent of its lot and equipped with a blatantly lit front, spoiling property values. His eagerness to keep it at arms length is understandable. Scheme A, however, illustrates a theater intended to obviate these prejudices.



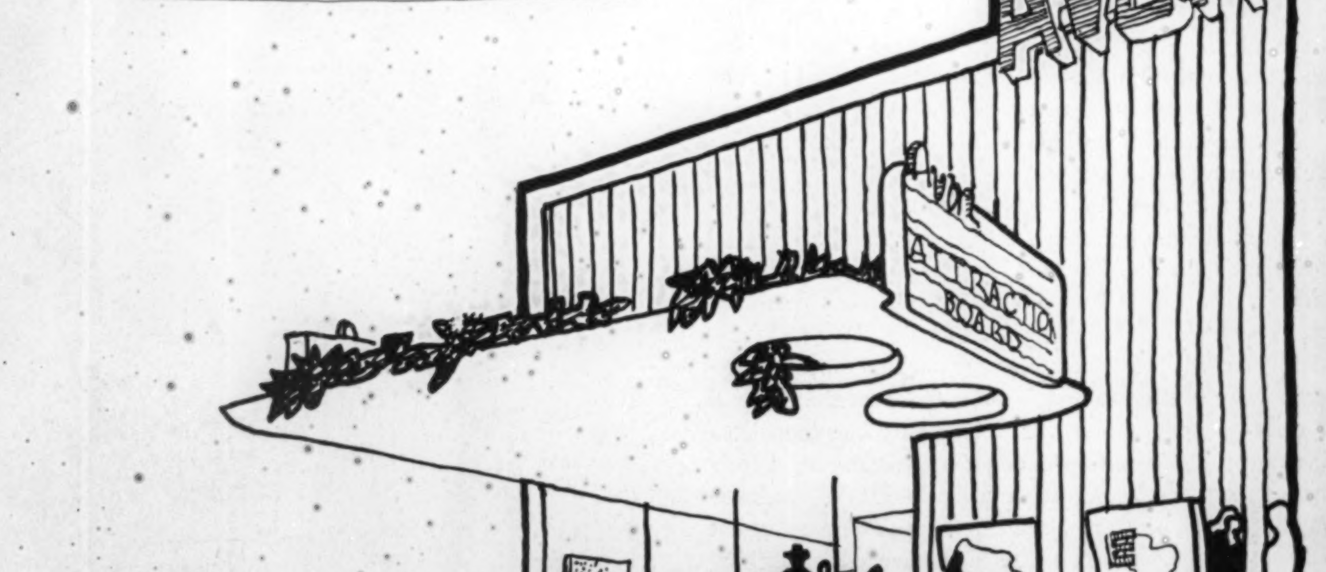
TREATMENTS must vary with circumstances. Top sketch conveys the authors' idea of pleasant treatment for a highway theater. This will not interfere with neighboring property values, will attract desirable patronage. The middle sketch represents the unthinking transfer into the countryside of blare and glare, which belong more properly in the less happy urban scene below

THE SMALL THEATER


UPPER PART OF AUDITORIUM
FIRE EXIT
MEZZANINE
PROJ. RM
FILM LIFT
TOP OF MARQUEE
ALLEY
AUDITORIUM
TEL
CANDY
FOYER
U
MOR
LOBBY
M.
W.
BOX OFF
FILM LIFT
MARQUEE
0
10
20
30


PROJECTION ROOM
STRUCTURAL FRAME
SIGHT LINE FROM REAR STANDEE SPACE

"SCHEME B" seen on this page was developed by the authors to illustrate the possibilities in a theater occupying a lot of only 40-ft. frontage on a downtown street. Use of so narrow a lot is made possible by the "Continental" seating plan of widely spaced seat rows and only two aisles (permitted by the fire underwriters' code but prohibited by many local codes). To prevent the auditorium from becoming unduly long, some of the seats are placed on a "mezzanine" which is cleverly designed as a "pseudo stadium" — meaning that a considerable part of the foyer area is tucked away under these seats. Discussion of auditorium width and of aisles will be found in text


AVON
ATTRACTION BOARD

The tiresome marquee of the immediate past is replaced here by a projecting overhang and attraction board. Coming-attraction poster displays are built into the front, which acts as placard

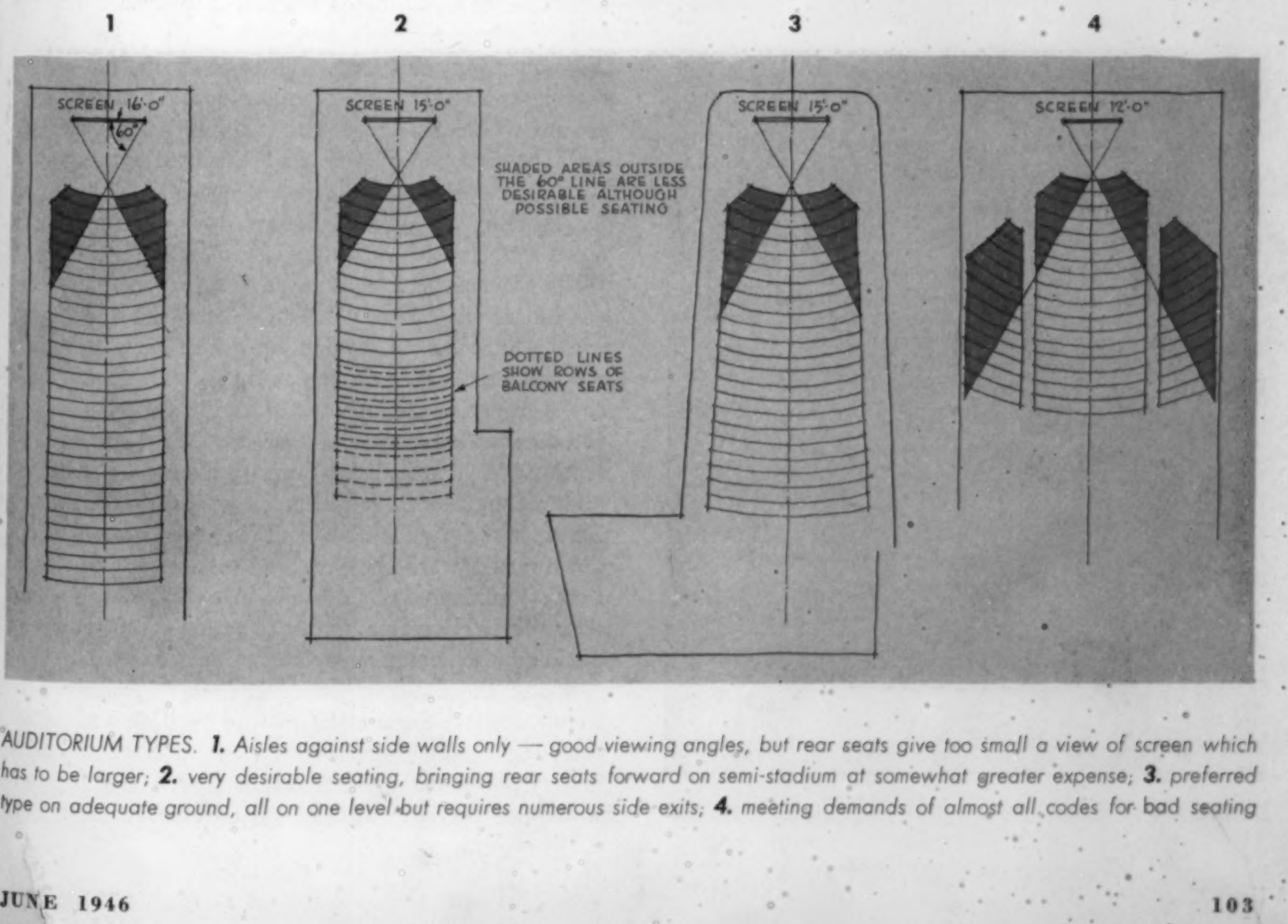
THE AUDITORIUM

The 400-seat motion picture theater for small towns and rural areas presents an interesting problem because its success depends upon the design which can be built most economically and be operated with a minimum of cost and maintenance. Its design from an optical and acoustical standpoint can be ideal because of the minimum viewing and hearing distances from the projected picture. It would be the ideal package size for the prefabricated motion picture theater, yet it is not very likely that it will appear in prefabricated form because the likely number of sales for such units would not be sufficient to tempt a developer to finance the necessary research and planning. The varying topography of ground sites, the lack of a uniform building code, and variations in operating policies also present important obstacles for the prefabricated development. The one logical method which is left for substantially reducing the cost of the 400 seat unit would be to promote the construction of a number of these units from one set of plans. These units would necessarily be placed where building code restrictions and operating policies would be uniform. Approximately a minimum of 10 such units would make the scheme workable. Actually this scheme would involve a certain amount of prefabrication advantages. The standardization of many of the parts of the structure would decrease the total cost substantially. The individual motion picture exhibitor can and does build a very low-cost motion picture theater and in many instances it is done without professional help.

It would be desirable to bring about some method whereby this type of construction could have the benefit of proper planning because the results obtained in the past have been most inadequate. The material presented in this compilation may help in avoiding some of the basic errors in planning and at least point to the elements which should be given special attention.

The 400-seat motion picture theater becomes an interesting unit because it can be used equally effectively for the projection of 16-mm. as well as 35-mm. film and, with the proper design provisions, can be made adaptable to the display of television pictures more easily than is possible in the case of larger theaters. The new arc-lamp projection machines made for 16-mm. film permit projection of a usable picture as wide as approximately 14 ft., a size that is readily adaptable for 35-mm. film as well as for these small units. At the present time, television pictures can be projected for a distance of as much as 70 ft. from the projector to the screen. This dimension comes within the range of the small theater plan. While television equipment may as yet be too costly, it is highly possible that in the very near future costs will be reduced sufficiently to make television a possibility in the small unit. Of course, the motion picture industry may reserve priority for larger motion picture theaters and may, therefore, delay its adaptation in a small house.

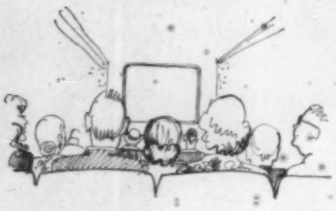
The diagrams seen below present an analysis of the governing factors in placing 400 chairs for viewing the motion picture. Diagram 1 shows all of the seats placed on one level with aisles only against each side


1
2
3
4
SCREEN 16'-0"
60°
SCREEN 15'-0"
SHADED AREAS OUTSIDE THE 60° LINE ARE LESS DESIRABLE ALTHOUGH POSSIBLE SEATING
DOTTED LINES SHOW ROWS OF BALCONY SEATS
SCREEN 15'-0"
SCREEN 12'-0"

AUDITORIUM TYPES. ***1.*** *Aisles against side walls only — good viewing angles, but rear seats give too small a view of screen which has to be larger;* ***2.*** *very desirable seating, bringing rear seats forward on semi-stadium at somewhat greater expense;* ***3.*** *preferred type on adequate ground, all on one level but requires numerous side exits;* ***4.*** *meeting demands of almost all codes for bad seating* wall. This seating plan is too elongated because of the restricted number of seats from aisle to aisle dictated by most of the building codes. The specified number is 14 in most instances. This seating form compels an unnecessarily large picture size for the seating capacity involved. This form is also difficult to handle acoustically.

Scheme number 2 (previous page) suffers under the disadvantage of the extra cost of mezzanine construction. The mezzanine seats, however, are very desirable for viewing the picture.

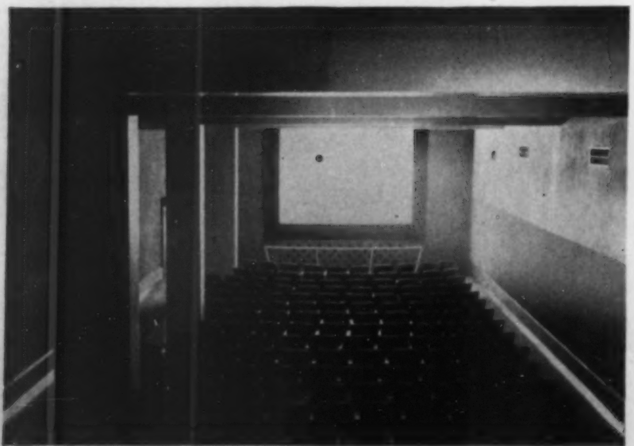
In order to devise a seating plan for 400 seats having all the seats on one floor and yet retaining a pleasing form, we introduce diagram number 3 in which there are more than 14 seats from aisle to aisle. This type of plan is usable only if local laws will permit such an arrangement or if there are no laws governing theater construction. This arrangement provides even greater safety in case of emergency in completely emptying the theater than the type of plan in which there are exit doors only at the screen end of the auditorium and a restricted back-to-back row spacing of 32 to 34 in. The National Board of Fire Underwriters Building Code permits a greater number of seats from aisle to aisle, as shown in this diagram number 3.



STAGGERING of seats frames the screen between the two heads in the next row forward; second row ahead may be safely ignored

The specific conditions under which this design can be used are set forth in the 1943 edition of the National Board of Fire Underwriters suggested code, under Article 13, "Places of Assembly, Theaters, Motion Picture Theaters, Assembly Halls and Garages." Section 1300 further deals with "seats in rows." Paragraph 1 (d):

"When individual fixed seats are provided or required, no seat shall have more than six seats intervening between it and an aisle; *provided that if the seats are fixed chairs with self-raising seats so spaced that when the seats are raised there is an unobstructed space of* not less than 18 in. horizontal projection between the *rows of seats, and doorways leading directly to exit corridors are provided not more than 5 ft. apart along the sides of the auditorium, the number of seats in a row shall not be limited.*"



Small theater, "Continental" seating, by Peter and Stubbins

MADAM HOW WOVLD YOV
LIKE TO SIT BEHIND THE
HAT YOV ARE WEARING.

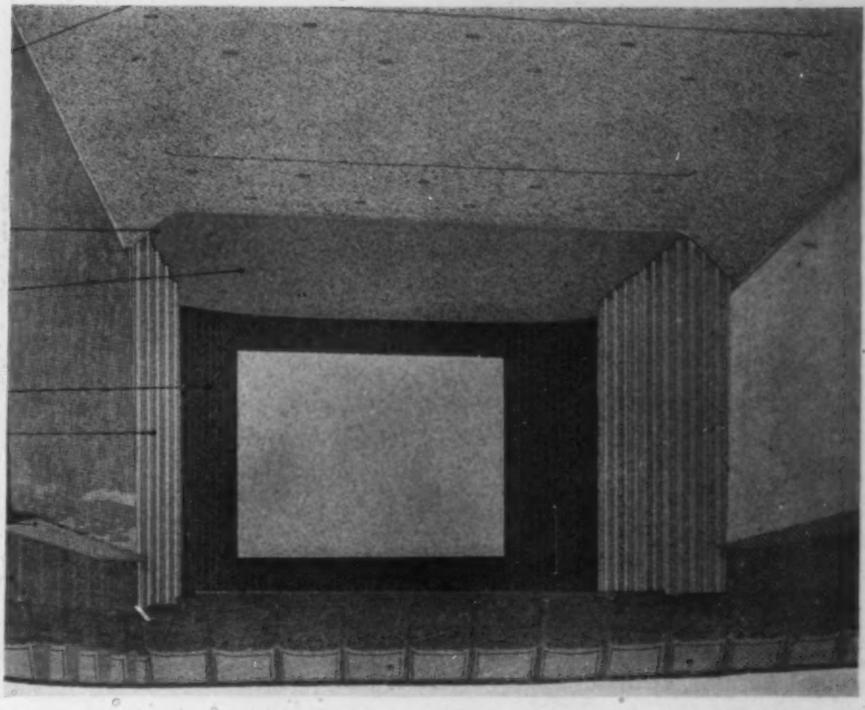
Photo courtesy The Westsider

In diagram number 4, 400 seats are arranged in a manner so as to reduce the objectionable depth of seating indicated in diagram 1. This is done by placing 7 seats against each side wall and having a section of seats in the center, 14 chairs wide with aisles as shown. This arrangement conforms to most building codes. It has many disadvantages, however. The aisles are necessarily placed in areas which are otherwise most valuable for viewing positions. The number of seats which come outside of the 60° viewing angle and afford poor viewing positions are far too many compared to any of the other diagrams illustrated. This shape should be avoided for this size theater.

FLOOR SLOPES

Unobstructed vision of the projected picture can be assured with various types of floor slopes. Steep inclinations are entirely unnecessary if a proper staggered placing of the chairs is arranged. A minimum of floor slope is always desirable. The slope of the main floor seating can vary from one that slopes downward only toward the picture to one that slopes partially downward toward the picture and thence slopes upward toward the picture. And in some special instances, the longest slope is upward toward the picture, with a downward slope toward the picture for only those rows which are most remote from the picture. In any case the amount of slope in any direction in so small a theater can be limited to a total of approximately 28 in. if a staggered seating arrangement is used. The topography of the ground or the inclusion of an upper level of seating will determine the type of floor slope for the main floor seating. A slope inclined downward only towards the picture is recommended when an upper level of seating is not contemplated and when the natural ground slopes downward toward the proposed picture position more than approximately 3 ft. Such a slope will place the exit door sills in closest proximity to outside grades thereby avoiding ramps and steps at exit doors.

Where the natural ground is more or less level or slopes upward toward the picture position and where there is no upper level of seating contemplated, the main floor slope should be one that is inclined partially downward and partially upward toward the picture. This



AUDITORIUM INTERIOR should be neutral; all attention on the screen

again will place exit door sills at desirable levels. Where the natural ground is as above stated and an upper level of seating is contemplated then the amount of slope upward toward the proposed picture position should be as great or slightly greater than the amount inclined downward toward the picture. This is advisable because it places the picture at a position which is more equally favorable to both the main level and the upper level seating and it also makes it possible to use minimum riser heights between seating platforms on the upper level seating. Only in isolated instances is there an upper seating level to be considered along with a strong upward ground slope of 4 ft. or more in a direction toward the picture position that is contemplated. In such instances the seating slope should be almost entirely upward toward the picture.

SIGHT LINES

The bottom of the projected picture should be not more than 72 in. above the floor of the row of seats nearest to the picture, regardless of the floor slope design. A higher picture position will create too sharp an upward viewing angle for those seated in the rows nearest the picture. Each slope should be carefully calculated. The slopes form very flat curves; also, the slope per row varies for every row. The eye of any viewer should have a direct straight sight line to the desirable arrival point of sight at or near the bottom of the picture (explained in the next paragraph). This line must clear the top of the head of all persons seated two heads or more in front of the eye in question. In any properly designed slope all heads three or more rows in front of the eye in question will be automatically cleared if the head two rows ahead is cleared.

Explanation of arrival point of sight: The arrival point of sight may advisedly be directly at the bottom of the projected picture or slightly above or slightly below this point subject to the particular row for which sight line clearance is being calculated. For example, in the 22nd row it is desirable to have the arrival point of sight approximately 10 in. below the bottom of the picture, whereas for the 5th row, the arrival point of sight can be as much as approximately 14 in. above the bottom of the picture. In the rows most remote from the picture, the arrival point of sight should come below the picture to provide a margin of safety because obstruction created by a person having an above-the-average torso is more serious than it is in rows close to the picture. This is so because in the remote rows a greater part of the width of the picture is blotted out by a head than is the case in the near rows. The reason for deciding to set the arrival point of sight somewhat above the bottom of the picture in the nearest rows is that a head in this area blots out only a very narrow part of the width of the picture. Great care should be exercised in the design of any floor slope and only a person well-versed in this art should be depended upon for best results. (See Time-Saver Standards, page 129.)

TYPES OF CHAIRS, SIZE AND SPACING

Lift-up seat cushions have been used in theater seating mostly because of the minimum back-to-back row spacing in past practice. This spacing, in accordance with most building codes and popular practice, has averaged about 32 in. A tendency now is towards increasing this dimension. A 33-in. spacing is now closer to the average mark with 34 in. being quite common in receding and new chair installations. If 36 in. were to be used (and there are many instances where it is being used) it is entirely possible that the chair with the lift-up seat cushion may change to a chair with a fixed seat cushion. This would make for a more comfortable and more practical chair because of the more sturdy construction made possible and the elimination of moving parts. The type of seating plan that calls for more than 14 chairs from aisle to aisle would require more than 34 in. row space. In order to conform with the National Board of Fire Underwriters Building Code, the row spacing for fixed seat cushions would be greater than the row spacing if self-raising seats were used.

Upholstery and fabric covering are desirable on the backs of theater chairs more for psychological and acoustical reasons than for actual comfort. There is no particular heavy pressure of the body against the back of the chair and, therefore, excessive spring or padded upholstery is unnecesary especially since any thickness in the chair back greater than 1 in. unnecessarily encroaches into the back-to-back row spacing. The seat cushion, however, requires sturdy and resilient spring construction because of the heavy pressure imposed on the cushion. Chair widths have been for the most part 18, 19, 20 and 21 in. The 18-in. width is entirely undesirable and the 20-in. is the average. The tendency now is towards using 20 in. as a minimum and as much as 22 in. wherever possible. More thought should be given to better arm block design in the wider chairs. Arm blocks now are of a very meager dimension and unstudied form. Chairs 23 and 24 in. wide have to be used in any staggered seating arrangement. Most staggered seating plans have chair widths ranging from 20 in. to 24 in. These varying widths help to control the position of the heads immediately in front of any particular viewer in a properly arranged staggered plan. The heads of the two people immediately in front of the viewer must be on either side of the horizontal lines of sight formed from the viewer's eyes to the extreme edges of the picture width. The angle thereby formed is comparatively narrow for the rows most remote from the picture and is too wide for the rows nearest the picture to make staggered seating usable in the close rows. The point at which the angle narrows down sufficiently to permit the start of the staggered arrangement is determined by the width of the picture and its distance from the viewer. In the portion of the seating area near the picture where staggered seating is made impossible by this wide angle, the floor sloping must provide for the viewer in this section to be able to see clearly over the head of the person directly in front. The floor slope in the staggered area is designed to provide a clear sight line from the viewer over the head of a person seated two rows in front. By fortunate coincidence the floor slope in the unstaggered area does not have to change appreciably because of the steeper vertical angles of vision in this area.

STANDING VIEWING SPACE

Standing viewing space behind the last row of seats on any tier of seating is undesirable because of the annoyance created for people in the last rows of seats. Moreover, the number of people that can be accommodated for viewing the picture from this area is very limited because only two persons in depth can view the picture in this manner at all successfully. It would be better to devote the depth usually given over to this area to foyer space in back of the auditorium. The so-called standing viewing space would then be converted to a minimum dimension cross-over used primarily for circulation to the auditorium seats.

Upper level seating may be either balcony type, stadium type or a type that looks like a balcony but really functions more like a stadium. A balcony is really a tier of seats on a level above the main floor seating and partially or wholly overhangs the rear rows of the main floor. A stadium upper level of seating consists of platforms on steep levels, the lowest level often being as little as 2 ft., approximately, above the level of a cross-over between the main floor seating and the stadium. When the stadium is set as low as this, a considerable portion of the area under it becomes waste space because of lack of head room. There are, therefore, many examples of stadiums raised sufficiently to create head room underneath for lounges, foyer, toilet and other required spaces. A further development of the stadium is the type in which the first few rows of seating overhang the cross-over behind the main floor seats, thereby bringing all of the stadium seats closer to the screen. This enables reduction of the picture size and permits double use of the floor area normally devoted to a main floor cross-over only. This latter scheme is one which appears to be a balcony but actually is a modification of the stadium. This scheme is illustrated in diagram 2 and page 102, showing reduced viewing distance and reduction of excessive tunnel-like auditorium shape. Upper level seating creates more seating area on a plot of ground that is short in depth, and upper level seating schemes of the projecting stadium type create more main floor area for the lobby, foyer, lounge, etc. The extra cost of the upper tier is almost entirely offset by savings in not having to extend the main floor area for the various auxiliary spaces required outside the auditorium proper.

Building codes governing theater construction should be strictly adhered to. In areas where there is no local code, the National Board of Fire Underwriters Building Code may be followed. However, in no case should chairs be placed as close together as the 30 in. allowed by this code. In any area where there is no building code in force, a 400-seat theater with all seats on one level should have at least one emergency exit on either side of the screen end of the auditorium. There should also be at least two entrance ways at the point of entry furthest from the screen. Each exit or emergency door should be at least 5 ft. in clear width, measurement being taken between a pair of doors swung open at right angles to the wall in which they are set. No exit door should obstruct any exit passageway in swinging into the passageway. All doors should open outward toward a street or alley, or safe passageways terminating in a street or alley. Likewise where a local building code does not prevail, balconies should have stairways not less than 4 ft. in width, with emergency exit stairways as well as entrance stairways. Where there are 100 seats or less in the balcony there should be at least one entrance stair and one emergency stair. Extra stairs should be added when this capacity is exceeded. All stairways should lead to the street or alley or safe passageway to a street or alley. In no case should they lead onto any part of the main floor.

The width of the projected picture is determined for best viewing conditions by dividing the maximum viewing distance by 5.2. The height of the picture to the width is as 6 is to 8.25, this ratio varying somewhat when the projection angle is greater than zero degrees. The greater the distance of the projection machine from the picture, the longer the focal length of the projection lens becomes, thereby improving picture quality. There is no loss in light because of greater projection distance; the proper selection of a lens takes care of delivering proper light intensity to a given picture size. In other words, a given light intensity will equally illuminate a 15-ft. wide picture for a projection distance of 50 ft. or 100 ft., the design of the lens being different in each case for projecting the light.

The first row of seats nearest the screen should be a distance away equal at least to the width of the picture. It is desirable to make this distance one and a quarter times the picture width wherever possible. Unless it is required for specific purposes a platform or stage in front of the picture should be eliminated since it serves as a distracting element in the picture's field of vision. The curtain used to conceal the screen from the public after or between showings should not be used during picture projection. Sufficient space should be provided for the curtain to be drawn completely out of view. A dull black material is frequently used to surround the picture proper, supposedly to absorb the fuzzy edge of the projected picture and make it stand out more satisfactorily. Actually this black area has been found to create a contrast with the brightly illuminated picture, creating eye fatigue. This masking can be reduced to about 3 or 4 in. in width and be made of a dark gray material instead of black to absorb the fuzzy edges. The area beyond this masking can be of a still lighter gray.

The projection room should be placed at as low a level as possible and yet high enough so that projected rays are not caught either by structural objects or persons walking in their path. It is advisable to reduce the downward projection angle as much as possible (the line formed from the lens center of the projection machine to the center of the picture). To eliminate noticeable distortion of the projected image on the screen this angle should be 10° or less. The projection room should be at least 10 ft. deep, with 12 ft. preferable. In small theaters it is frequently desirable to use the entire width of the building, or as nearly as possible, for projection room requirements.

For further details on proiection room planning see page 115 and Time-Saver Standards, page 131.

Fixed seats a possibility if row spacing is adequate in Continental seating plan. One of these appears tight (auditorium in Poland)

BUDGET *(Continued from page 101)*

renting and buying business is so complicated that several volumes would be required to explain its workings. Suffice it to say here that the principal factors affecting the picture's availability are the seating capacity of the theater in question and its location in relation to other theaters. If your client's theater is a small house and the only one in the community, he may be compelled to follow other theaters in surrounding towns as much as 30 to 50 miles distant, and may have to wait as long as 21 days after his nearest competitor has completed a showing.

Although building rentals or rental equivalents vary widely, the items so classified begin to become excessive when they go much over 20 per cent of the average annual gross.

The following itemization, while very general, gives a glimpse of the small theater operator's budget:

Budget Item	***Percentage of Total Budget***
*Film (including shipment)	30
Advertising	3
*Salaries and Wages	6
Rent (or Taxes, Interest, Repair, etc.)	25
*Electrical Power	2.75
Depreciation	8
Maintenance	6
License (negligible) and fuel	0.05
*Insurance (Liability)	1.50
Miscellaneous overhead	2.75
Total	85.05

* Highly variable, depending on local labor conditions, physical condition of theater, location of theater, etc.

Important caution: In many cities the wage scale set up by the motion picture projectionists union is based on the seating capacity of the individual theater. Do not try for extra seats without checking this.

THE SMALL THEATER

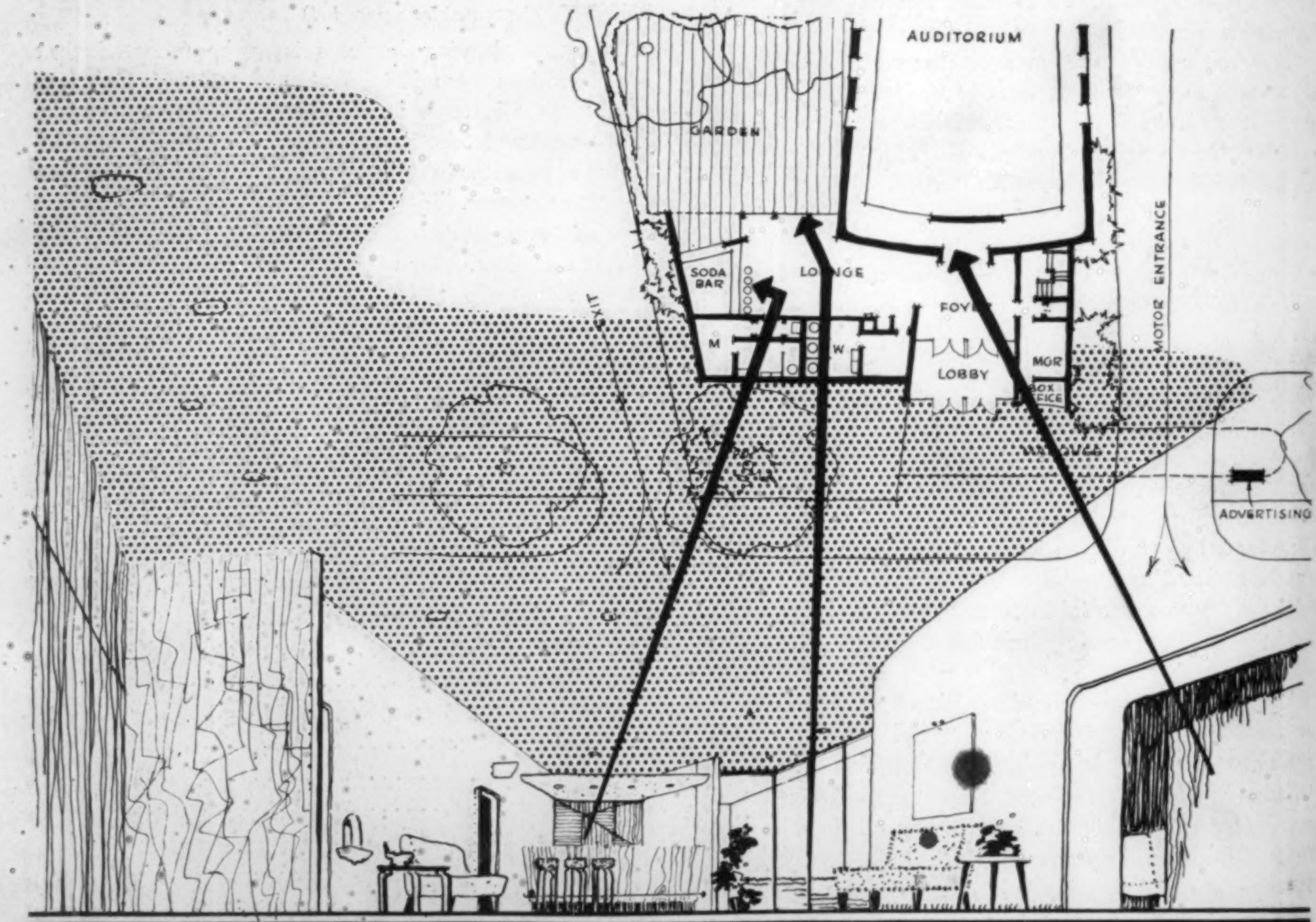
AUDIENCE ACCESS AND CONVENIENCES

The amount of space given over to auxiliary requirements outside of the auditorium will vary according to budget. The scheme on page 102 illustrates minimum space for auxiliary requirements and the scheme seen below increases the areas to an amount consistent with their maximum usefulness. Space limitations are always important and, as previously demonstrated, more area on the main floor is obtainable by employing an upper level of seating. The lobby space between the first and second set of doors leading from the street can always be a minimum area because its chief function is to act as a weather lock. The foyer space beyond this area, on the other hand, should be as large as possible and, if space permits, should include a portion designated as a lounge. A ladies' powder room for a 400-seat theater should be a minimum of approximately 6 ft. 6 in. by 8 ft. 6 in. and should be arranged to have one complete wall for mirrors and benches. The manager's office should, if possible, be directly connected with the ticket selling office. The drinking fountain should be located in the foyer and in a space outside of the heaviest lines of circulation. Candy stands are popular and should be placed where they will be visible on entering the foyer.

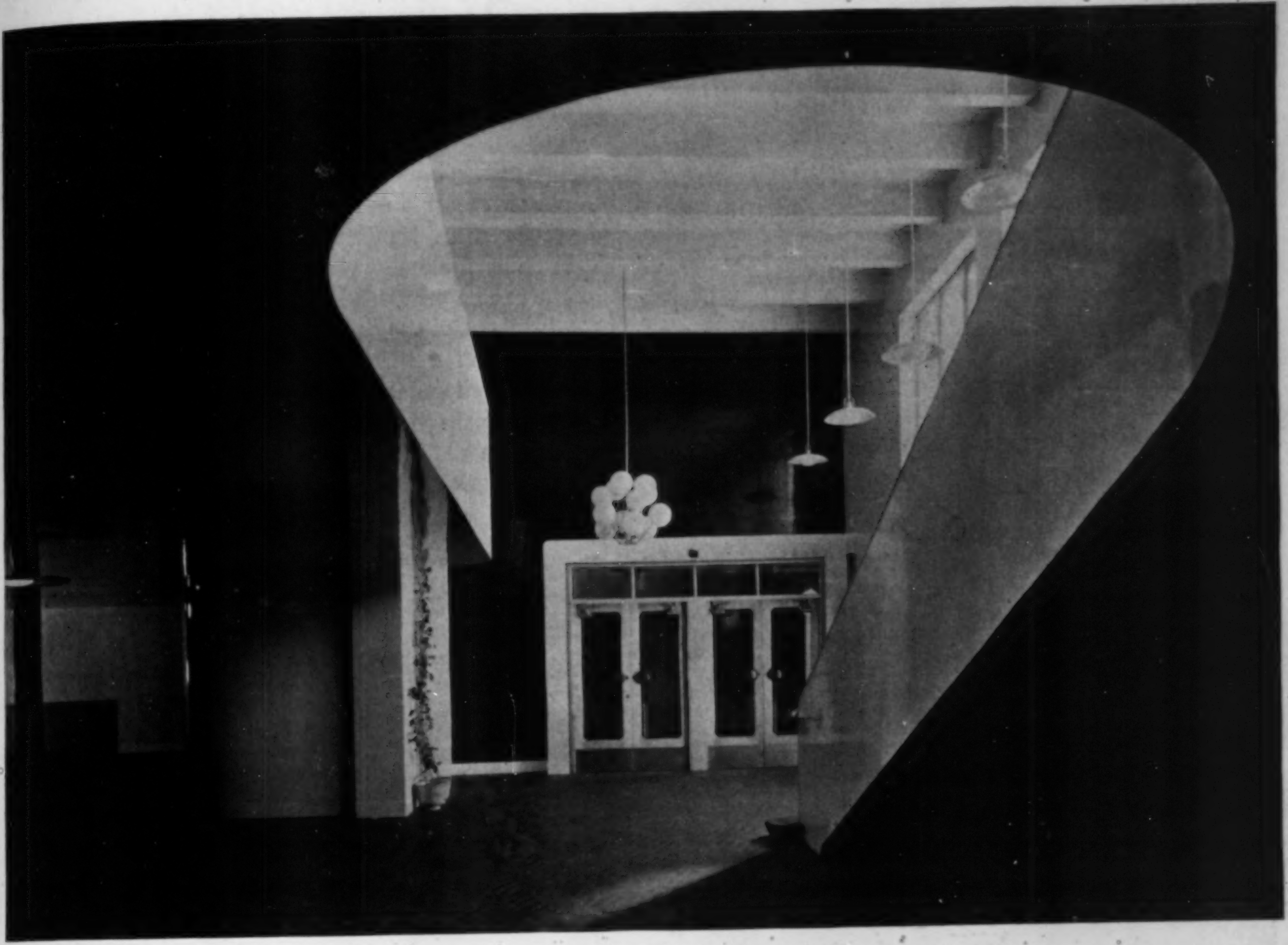
TICKET OFFICE

Most admissions are made through the sale of tickets from an electrically-operated ticket-dispensing machine, requiring a ticket seller and a ticket-collecting attendant. While it might be possible to eliminate both of these employees by using a coin inset turnstile, such a scheme leaves the problem of change-making unsolved. It also eliminates the valuable asset of having someone to answer questions, of which there are many from the ticket buyers. Sometimes a turnstile is used to eliminate the ticket collector. The ticket seller trips the turnstile arm to allow the customer through. This is a compromise solution; but since the ticket collector in the

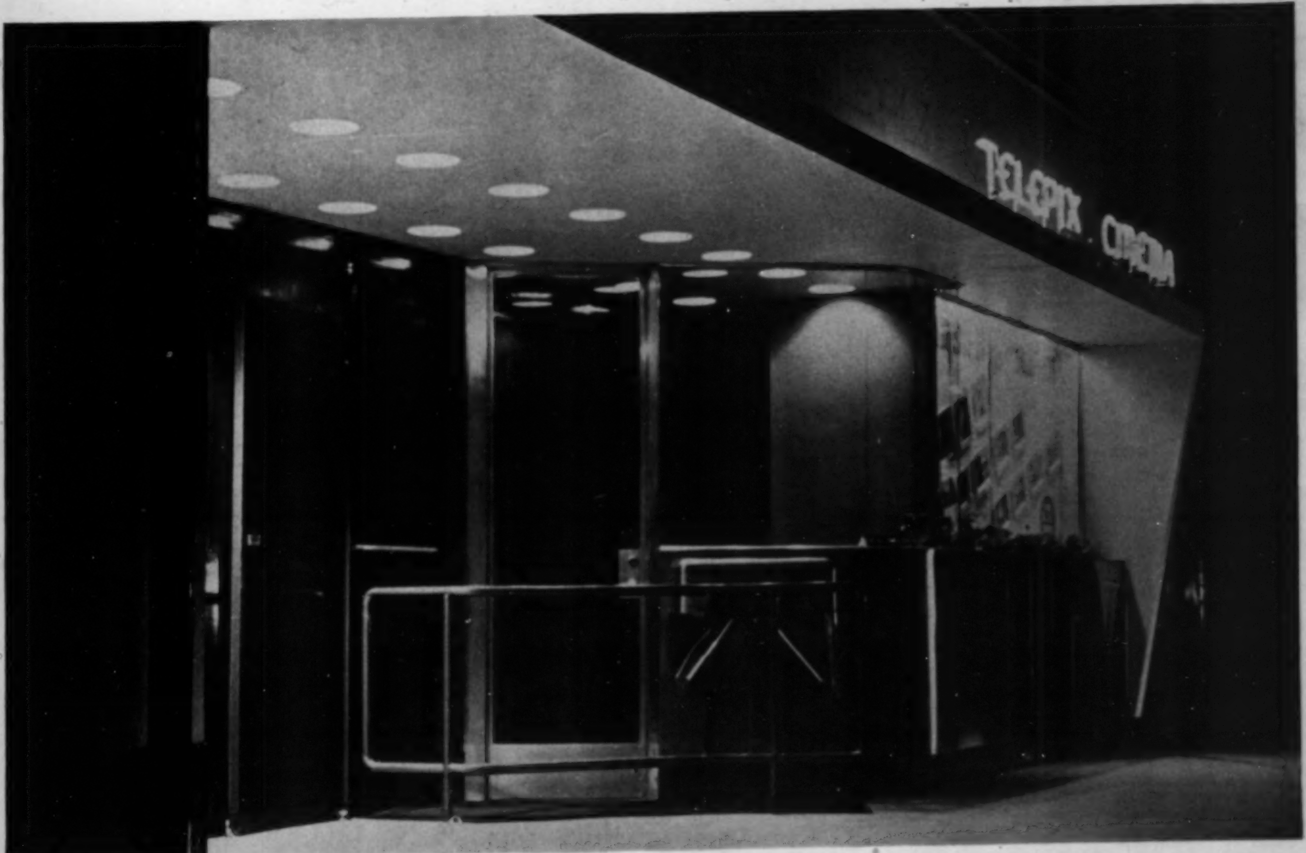
(*Continued on page 110*)



FOYER AND LOBBY, above, are fully developed, for a situation where land costs are not too high. The lounge is off to one side of traffic where it can be used at leisure. Men's and women's rest rooms are easily found by patrons. (Door to men's room shows in the rendering but is covered by the arrow in plan). A standee screen is needed behind the auditorium entrance to block stray light from the street. PHOTOGRAPHS, opposite page, show clean design solutions for problems parallel to ours but not quite the same. The upper view shows sumptuous accommodations in a 500-seat theater in Finland — the plentiful daylight is kept out of the auditorium by the right-angle placement of the doors. The turnstile arrangement in a newsreel theater is possible but not recommended for the regular 400-seater



Above: Foyer and balcony stair well in a small theater of approximately 500 seats at Turku, Finland; Eric Bryggman, architect. Below: Turnstile in Telepix newsreel theater in Boston, Mass.; Peter and Stubbins, architects



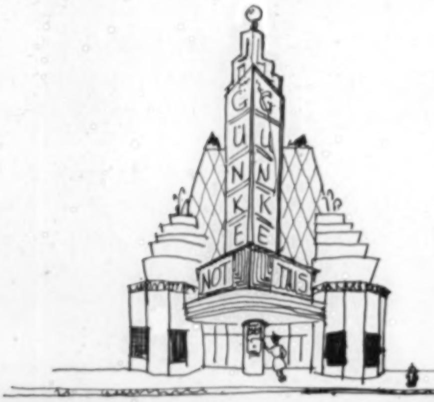
(Continued from page 108)

small rural theater is usually the assistant manager at the same time, it might be more practical in most instances to stick to a standard ticket-selling scheme.

The ticket office should be accessible from the interior of the building and should be convenient to the manager's office. Both heating and ventilation should be provided. Public and intercommunicating telephone instruments should be provided because the ticket seller answers all questions in the manager's absence.

TOILET ROOMS

Toilet rooms for the 400-seat theater should be of minimum area sufficient only to accommodate properly the required number of plumbing fixtures. The minimum number of fixtures would be two water closets and one wash basin for the women and one water closet, two urinals, and one wash basin for men. Ceiling height should be minimum so that the entire wall height can be tiled. Recommended water closet compartments are of the ceiling-hung type, leaving the floor completely free for washing and hosing. Toilet room floors should drain for rush cleaning. Toilet rooms should have an independent exhaust ventilating system. Fresh air intake can be provided by making the toilet room doors 2½ in. short of the saddle. Toilet room entrance doors should be off the foyer and in such position as to be away from the main lines of circulation to and from the auditorium. A view into any part of the toilet room interiors should be avoided by arranging the doors and walls to block possible sight lines.

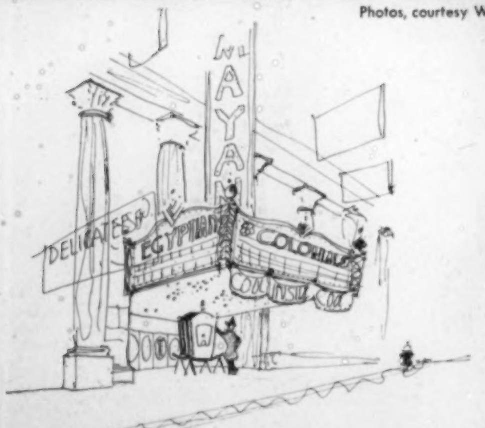


MATINEES DAILY
MATINEE
TO-DAY
AT 1.30 P.M.

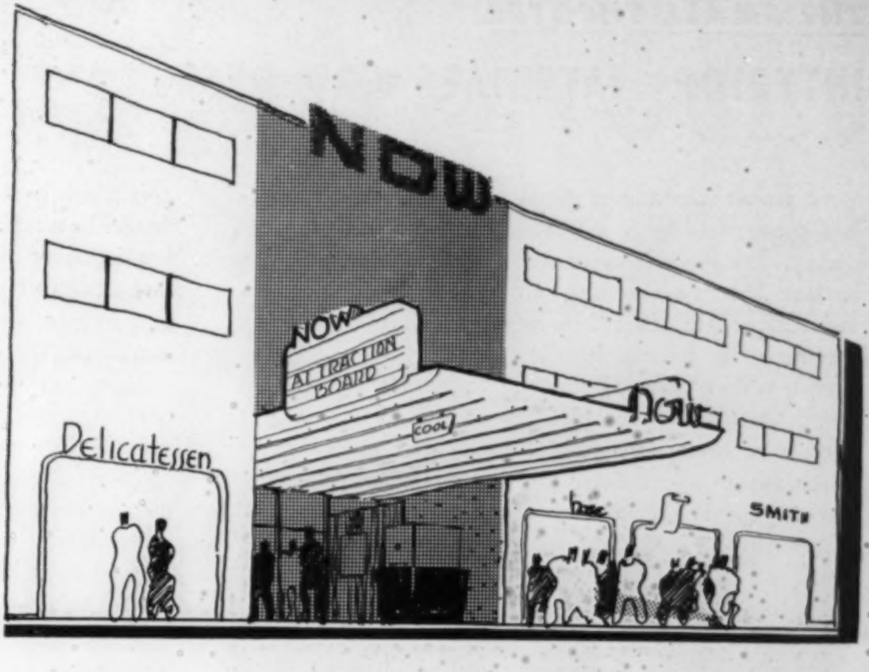
Above: The Cascade "Nickelodeon" (1903), New-castle, Pa. Right: Apollo Theater (1905), Atlantic City. Below: Regent Theater (1914), New York

Photos, courtesy Warner Bros.

Photo, Museum of Modern Art



"EXPLOITATION" FOR THE SHOW



THE exploitation problem is entirely different for a 400-seat rural or small-town theater than anywhere else. Customers do not have to be picked off the street in competition with other houses.

The theater marquee extending over the sidewalk has become a fixed institution and a fixed idea among owners, and yet the small theater surely does not need this appendage. Its first cost is high; it consumes considerable electric current; maintenance is burdensome.

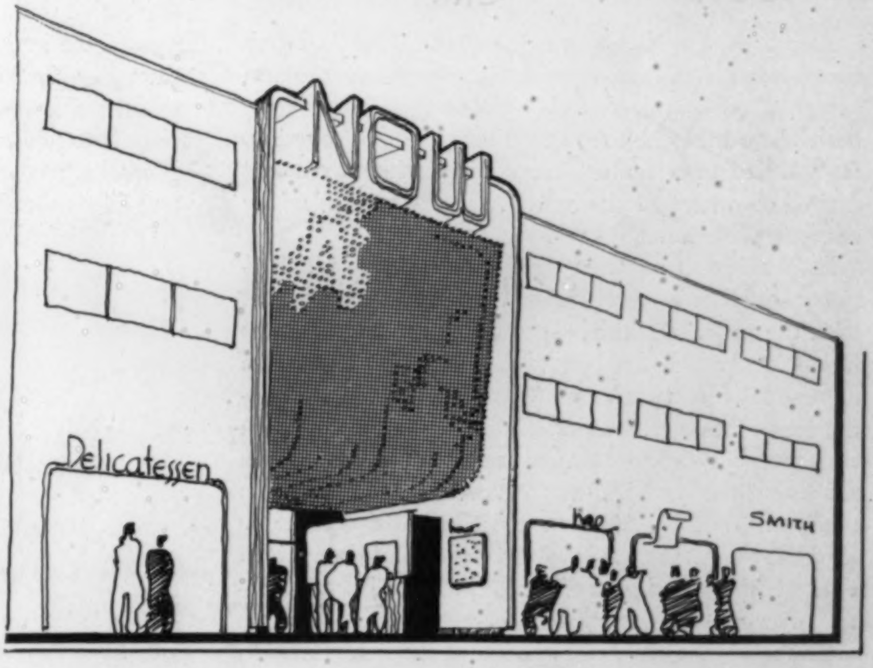
The small theater exhibitor's exploitation problem consists chiefly in keeping his patrons informed of the current and coming attractions. He has at his disposal local newspaper advertising, film trailers, and direct mail advertising, as well as interior and exterior poster displays. *A large number of small theaters has now been built without the marquee, and the operation of these theaters has been completely successful.*

Display frames for posters, placed on the front of the building and in the lobbies, should have interior illumination. This requires space for the lamps around the margin, and a depth of at least 14 inches. Common poster dimensions: in paper (from producers or National Screen Service): "1-sheet," 27 by 41 in.; "3-sheet," 41 by 81 in.; in cardboard (from National Screen Service) 30 by 40 in. or 40 by 60 in.

High illuminated towers or vertical illuminated signs are not necessary unless the theater patronage is largely derived from automobile traffic on main highways. For a 400-seat theater they are a doubtful luxury.

One of the most important possibilities — not often thought of as "exploitation" — is the provision of comfort and cleanliness for the patron. The things which are most certain to keep patrons coming back are adequate and suitably maintained rest rooms; comfortable seeing and hearing; and a friendly atmosphere. These head the list as factors of effective exploitation.

FROM THEN TO NOW — Pictures on these two pages show the trends. Early theater fronts, if naïve, were quite engaging. Later came the agglomeration of Egyptian and Colonial columns, still later "modernistic" gunke. The trend today is toward simple directness. At top, this page, the projecting hood disembarrassed of the clumsy marquee, an "attraction board" remaining; to the right, below, a glittering facade of glass mosaic attracts attention to the institution

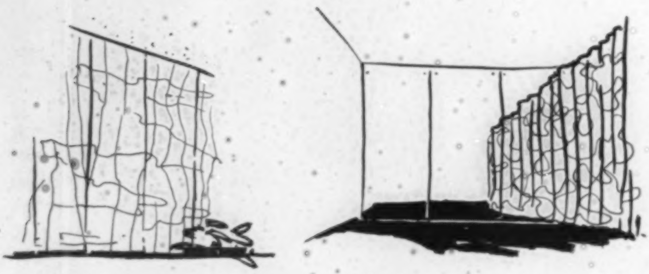


THE SMALL THEATER

INTERIOR MATERIALS AND DESIGN

The proper selection of decorative materials is becoming more and more important in progressive theater design. Latest thinking stresses simplicity of wall surfaces, floors and ceilings and greater interest in surface texture. It is, therefore, important that the covering materials be honest in their application. Imitation marble walls of painted plaster and manufactured board to simulate tiles and wood have no rightful place in correct architectural design. Ideas on the design of space within the theater and materials in that space have changed so much in recent years that the majority of today's theaters are outmoded in appearance. Maintenance of materials has also been long ignored and in consequence the annual upkeep, especially of small theaters, becomes a critical factor.

The periods of gilded plaster and garish modernistic modern of the 1930's are too evident in their bad taste to form a pattern for the modern small theater of the future. The use of metal moldings for decorative effect has been greatly overdone. Use a metal molding if you must to cover a joint in the wallboard but do not apply it on the wallboard to satisfy a decorative urge. Use sculpture, paintings and drapery or plants for decoration. Economy of budget and the effect desired within the concept of modern design dictate the use of the right material in the right places. For instance, cement asbestos board may be used as a decorative wall covering. Its mottled gray texture harmonizes with any colors desired elsewhere and its hard surface makes it ideal for easy maintenance.



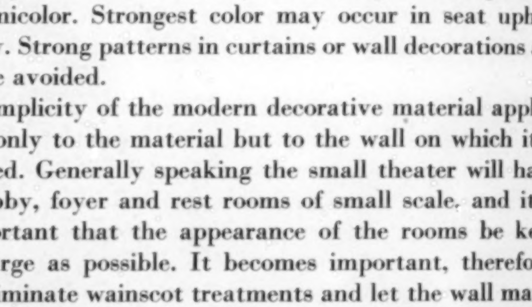
If budget prohibits marble, avoid imitations. Floor to ceiling mirrors reflect other decorative details, suggest spaciousness

Hard surface permanent finishes of time-tested materials should be used wherever they come into contact with the public. Marble, slate, brick, cement, asbestos board, hardwood, plywoods and asphalt tile should give a range in color, texture and cost to please the most exacting. Painted surfaces should be kept to a minimum since they require constant maintenance. Painted dado finishes which are subject to hard usage should be avoided. Wherever carpets are used as a floor covering subject to constant traffic, plain colors should be avoided unless they be in shades of earth brown or gray. A general over-all abstract pattern carefully selected as to color and kept in scale with the size of the space in which it is used is the most satisfactory. (Some carpeting should be bought in excess of actual requirements to be used in repair of damaged places.) Linoleum, rubber and asphalt tile when selected with care as to color and pattern can be used effectively as a floor covering within the range of a minimum budget.

This type of floor covering can be extended as dado covering provided proper backing and adhesives are provided. Terrazzo, marble and glass mosaics make for excellent decorative wall materials. The use of glass mosaic should be introduced cautiously and again in right places for a desired decorative effect.

In general, the same decorative finishes used in the lobby and lounge may be carried into the theater auditorium. The acoustic treatment in this room will become a major part of the finish and is best done when left in its natural manufactured state. Many acoustic materials have an integral finish and need no additional painting. Their color should be neutral as should all other auditorium colors. Very dark, very light or excessively strong colors distract the eye from the picture, especially technicolor. Strongest color may occur in seat upholstery. Strong patterns in curtains or wall decorations are to be avoided.

Simplicity of the modern decorative material applies not only to the material but to the wall on which it is placed. Generally speaking the small theater will have a lobby, foyer and rest rooms of small scale. and it is important that the appearance of the rooms be kept as large as possible. It becomes important, therefore, to eliminate wainscot treatments and let the wall material carry from floor to ceiling so that the eye is conscious of the total ceiling height unbroken by a change of wall material. Mirrors can be used decoratively on walls when put from floor to ceiling at right angles to a major decorative wall. When done this way the color and richness of the major wall is carried on a greater distance through reflection in the mirror. The color of the mirror may be selected from several shades but the common error is to select a mirror color not in harmony with the general scheme. Glass sizes should be as large as possible and joints should not be at eye level.



Ceiling to floor wall treatment surrounding candy counter focusses attention on concession; apply same treatment to display panels

ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

THE SMALL MOTION PICTURE THEATER (continued)

STRUCTURAL ECONOMY

STRUCTURAL FRAME: The following alternate types of roof are illustrated:

A. Triangular roof truss
B. Flat roof truss or long-span steel joists
C. Hipped rigid frame
D. Gabled rigid frame
E. Arched frame

These may be fabricated of wood, steel or concrete, depending on the local economics of these materials. A fundamental choice of flat or sloping roof surface is presented. Sloping roofs reduce the heights of walls and snow loading. Parapets may be omitted if roof slopes exceed 20°, but gutters for drainage are necessary. For roof slopes greater then 20°, as in the hipped frame, the visibility of the finished roofing must be considered and an attractive material used.

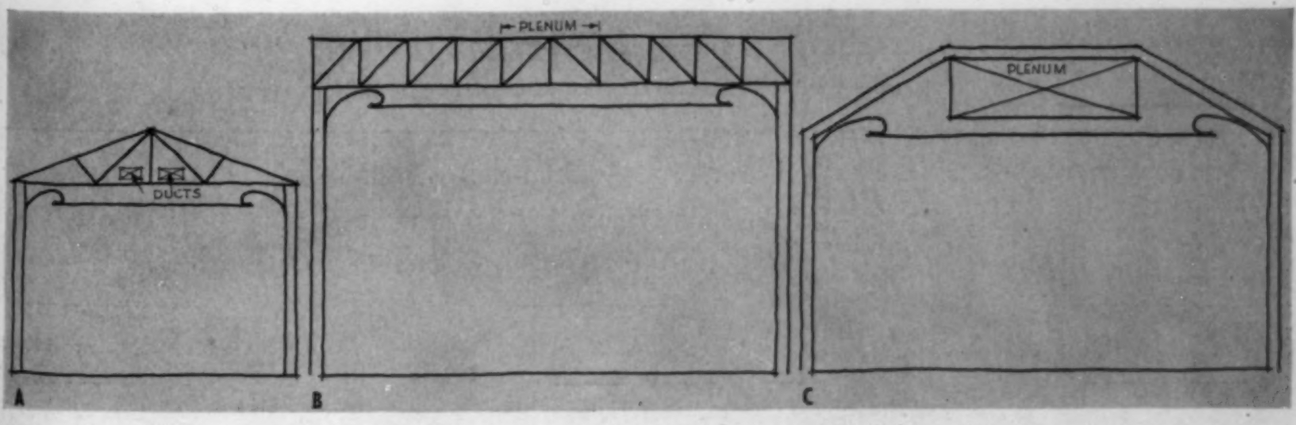
The interior ceiling treatment varies as illustrated. A suspended plaque treatment may be used except for the arched interior (E). Ventilating ducts and cove lighting are readily provided in all cases except the arched interior where sloping furred walls become necessary. The arched interior is not acoustically favorable.

For steel construction, a choice of riveted or welded trusses and frames is presented. A typical welded knee and column base is illustrated for a steel rigid frame which shows the simplicity of detail in welding. (Next page.)

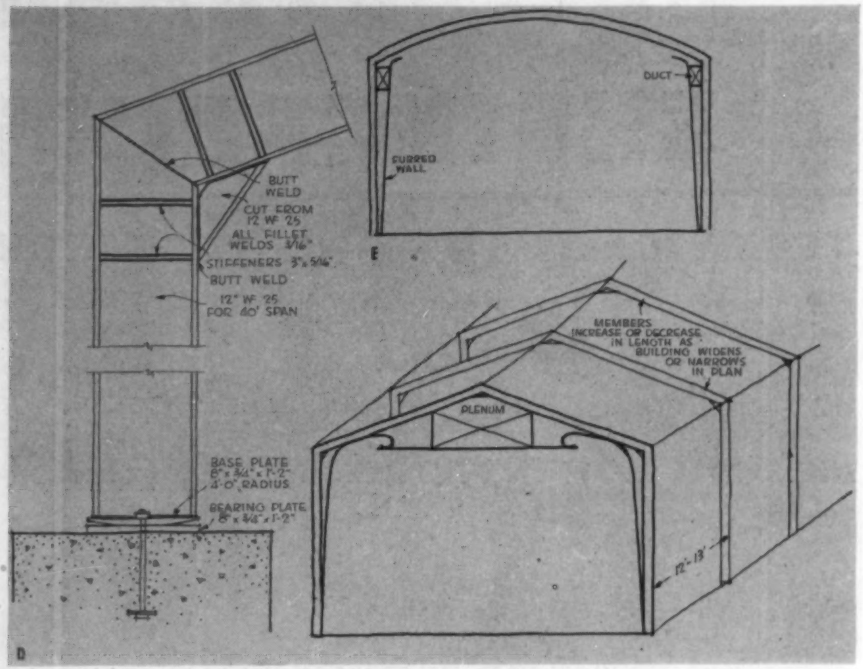
Structure is a function of plan and section. The walls may be parallel or tapered in plan, but parallel walls are objectionable acoustically especially for narrow theaters; for tapered walls, the important cost issue of varying spans is raised. Economy in trussed roofs is obtained only in repetition of identical trusses and severe cost penalties result with varying spans. A great virtue of the rigid frame designs is that, with identical knee details, varying spans and column heights can be provided by changing the in-filling lengths of members. This is illustrated in perspective of the gabled rigid frame (D), next page.

The insurance ratings for various materials and assemblies must be carefully investigated with the Fire Underwriters, since the possible cumulative savings in premium costs may be quite important.

PREFABRICATION: Standardization possibilities for the small theater naturally depend on a standardized plan for the auditorium for varying seat capacities and considerable repetition of identical units. The steel rigid frame (D), as previously described, can be economically shop fabricated, with minimum field connection. The tendency in roof material would be to use rigid panels of minimum volume and of size permitting easy transit and handling. Pre-built wall panels must have required fire rating and rigidity and successful joint treatment. Interior treatment would tend to



Varying structural treatments are discussed in text. More diagrams on next page


BUTT WELD
CUT FROM 12 WF 25
ALL FILLET WELDS 3/16"
STIFFENERS 3" x 5/16"
BUTT WELD
12" WF 25 FOR 40' SPAN
BASE PLATE 8" x 3/4" x 1'-2" 4'-0" RADIUS
BEARING PLATE 8" x 3/4" x 1'-2"
D
DUCT
FURRED WALL
E
MEMBERS INCREASE OR DECREASE IN LENGTH AS BUILDING WIDENS OR NARROWS IN PLAN
PLENUM
12'-13'

rigid panels or may be applied at the site and variety introduced.

Many studies on prefabricated possibilities for the smaller theater are progressing but no structures have yet been built. Successful fermentation in the general field of pre-built panel materials will, of course, be reflected in theater construction.

STRUCTURAL DIAGRAMS

Previous page: ***A****, triangular roof truss;* ***B****, flat roof truss or long-spanned steel joists;* ***C****, hipped frame.*

This page: ***D****, detail and perspective of rigid frame construction for gabled roof taking care of varying spans as theater widens;* ***E****, arched frame.*

The curley-cue lines represent light coves

STRUCTURAL ANALYSIS

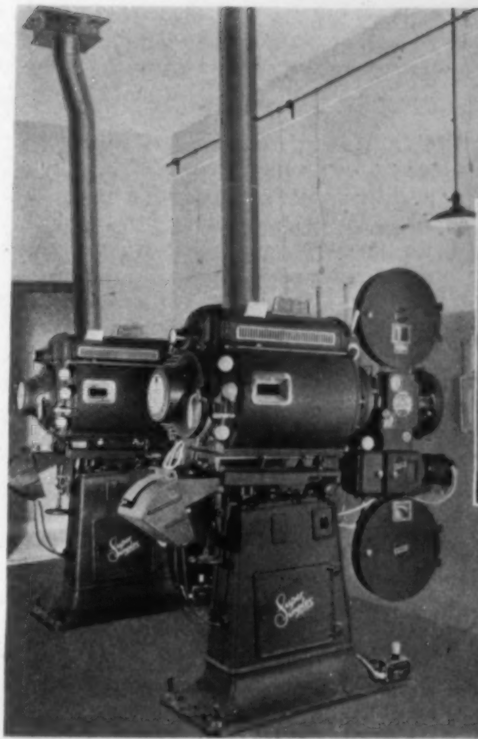
ITEM	*FOUNDATIONS*	*FRAME*	*WALLS*	*ROOF*	*CEILING*	*FLOOR*
Design factors to consider	Frost Soil capacity Necessity for piling Underground water	Safety Economy Fireproofing Bracing Cross Section (See Study of Types)	Initial cost Maintenance Weather tightness Insulation Acoustics Appearance Thickness Weight Condensation	Weather tightness Insulation Initial cost Maintenance Weight Appearance Drainage Climate	Maintenance Lighting Ventilation Treatment Accessibility Acoustics	Insulation Finish Maintenance Ground water Seat support
Choice of Materials (Suggestions—not intended as complete checklist)	Concrete Concrete masonry	Steel girder Steel trusses Steel rigid frames Steel long-span joists Concrete frames Wood trusses (See illustrations)	Brick Hollow brick Concrete masonry Structural clay tile Plastered furring Rigid board furring Corrugated asbestos	Built-up roofing Asbestos or asphalt shingles Slate Clay tile Corrugated asbestos Metallic roofing	Gypsum, cement or acoustic plaster Acoustic tile Corrugated asbestos	Concrete Cinder fill Gravel fill Hollow tile under floor Cement finish
Building Code Requirements (National Board of Fire Underwriters—1943 Edition)	See Code	Wood trusses Steel or concrete trusses or frames	8 in. solid masonry with piers or columns of max. spacing 13 ft. 12 in. hollow masonry—max. 20 ft. high (non-bearing) No parapets for roof slope exceeding 20°	Wood, steel or gypsum roof decks	Fire-retardant, not less than ¾ in. gypsum plaster or equivalent	Live loads Orchestra = 60 psf Balconies = 60 psf Aisles, corridors and lobbies = 100 psf Stage floor = 150 psf (National Bureau of Standards—1945)

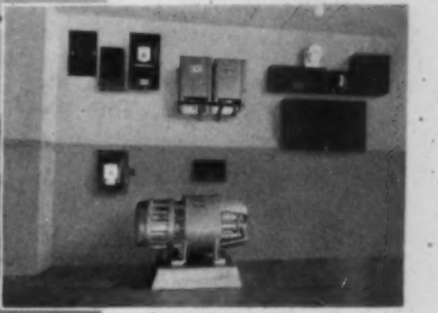
PROJECTION

STANDARDS for projection room planning published in the Society of Motion Picture Engineers Journal (Sept., '42) and abstracted as Time-Saver Standards (AR Feb., '43) persist as fundamentals for guidance in current practice. Time-Saver Standards in this issue give latest supplementary data on front wall and port planning, wiring, ventilation and fire shutter systems (page 131). Provisions for 16-mm equipment are not covered in these data.

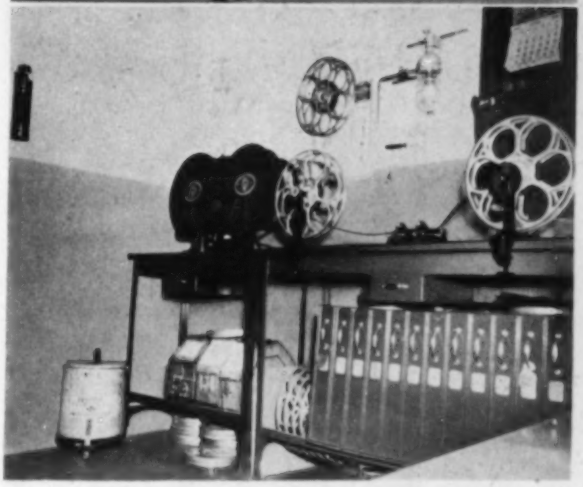
Spurred by the extensive and effective use of 16-mm films for training in the armed forces, producers are presently at work creating a big product in this dimension, with one-reel special features designed primarily for use in smaller theaters where shorter throws make them most advantageous. Sketches below show correct and incorrect planning for 16-mm projection. Yielding to the urge for symmetry by placing the 16-mm projector between the 35's is bad because it gives preferred position to the machine least used. Placing it on the flank as shown achieves an acceptable image on the screen from the 16-mm with a minimum of distortion from the two 35's. Additional advantage may accrue in future use of the 16-mm port and position for television equipment. Dimensions given in the sketches below and in Time-Saver Standards are minimal. Architects should check carefully actual equipment to be used before specifying clearances and height of portholes.

It is well to emphasize again the vibration factor in projection room planning (see discussion by John J. Sefing, AR June '44, p. 95). In theaters of the size treated in this study, inadequate stiffness in construction, permitting as little as 1/500 in. vibration in the projection room floor, could cause half-inch jitters of images on the screen.

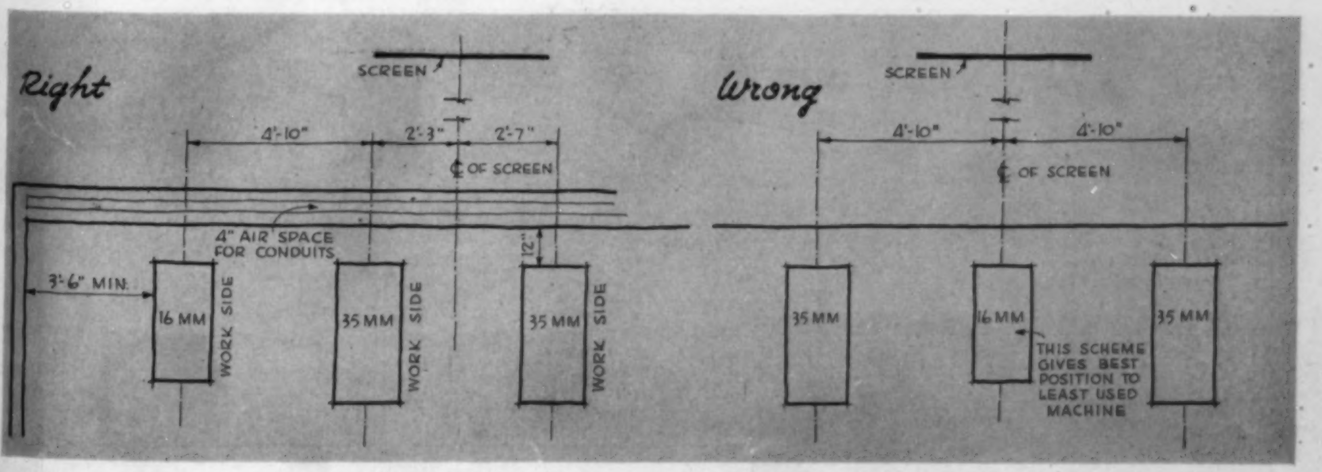




Courtesy National Theatre Supply Co.



Above: Power equipment room. In 400-seat theaters, AC rectifiers replace generator shown here. Above, left: 35-mm projectors in position; exhaust flues connected to overhead duct, running directly to outside air, should provide minimum of 16 cu. ft./min. to each carbon arc lamp. Left: Separate rewind room should provide no less than 80 sq. ft. of floor space; observation ports are required into both the auditorium and projection room



SMALL THEATER ACOUSTICS

In treating a small 400-seat theater acoustically, we must consider four fundamental properties of the structure:

1. The relative proportion of length, width and ceiling height.
2. The reverberation time or the time required for sound to die away.
3. The elimination of standing waves and interference patterns.
4. The tonal characteristics of the house.

Each of these four considerations has been taken into account in the auditorium designs shown on page 101.

In the second plan, intended for a long narrow lot, it was found advisable to provide for the proper number of seats by an overlapping design making use of a balcony in reducing the total length of the auditorium. This has the good effect of bringing the ratio of length to width close to a value of 2 to 1. This value should never be greatly exceeded. The ceiling is high enough to clear all projection lines (see cross-section on page 102), yet it is low enough to hold the cubicle volume per seat somewhere between 110 and 140.

REVERBERATION TIME AND INTERIOR SURFACES

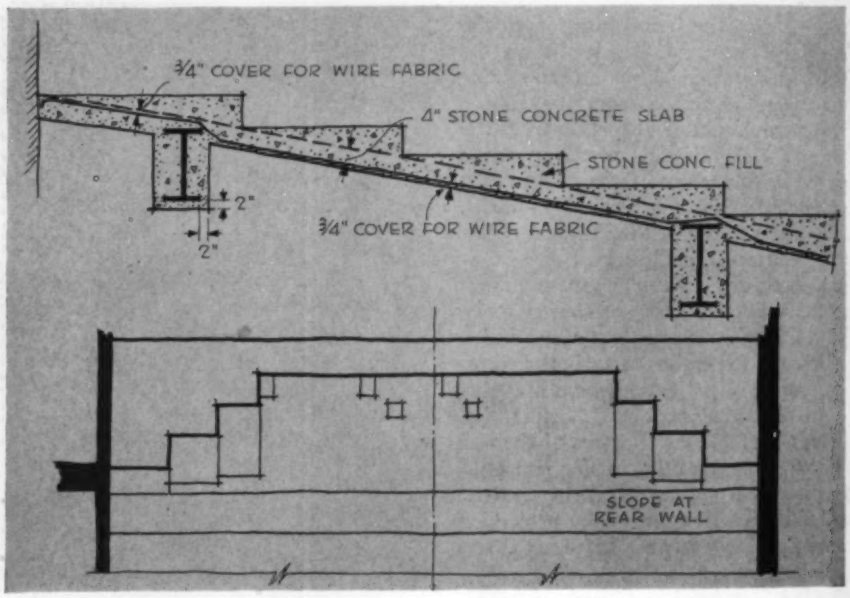
In a house of this size, having upholstered seats with upholstered backs, no additional absorbent materials are needed. The audience, the carpeted aisles, and the effect of the empty seats will provide a sufficient amount of sound absorption to reduce the time required for sound to die away. If more absorbent materials were used, the house would merely sound too "dead."

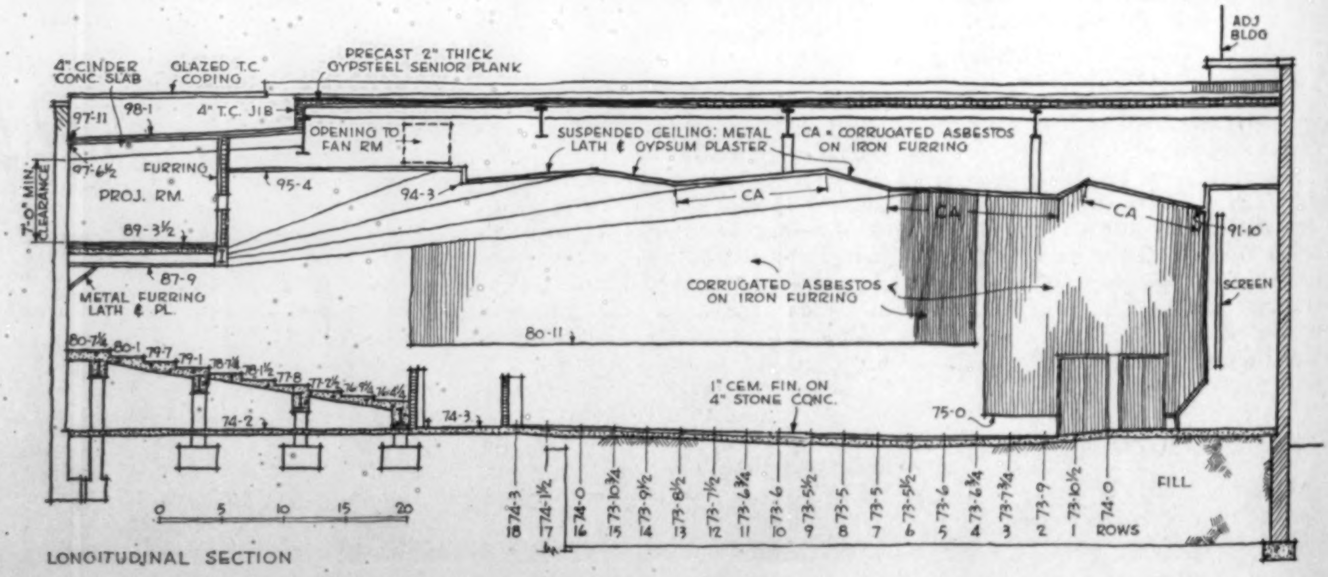
"Standing waves" and sound interference patterns are caused by opposing parallel surfaces. By placing the walls out of parallel to even a slight degree, the wall may be dispersed so as to be no longer objectionable. This sound dispersion may be arranged for by splaying in both the vertical and the horizontal plan. Avoid the occurrence of concave surfaces which would tend to collect reflected sound at their focal points.

TONAL CHARACTERISTICS

The tonal response of a house seating 400 may tend to be more brilliant at the higher voice and musical harmonic tones than the response in a larger house. In order to keep the sound pleasant, it may be necessary to modify the sound system by increasing the sound loss from 2 to 6 decibels at 8,000 cycles per second, over and above the 18 decibels indicated in the *Recommended Frequency Characteristics* published by the Research Council of the Academy of Motion Picture Arts and Sciences for the guidance of theater owners and theater architects.

ACOUSTICAL DIAGRAMS: Though taken from a somewhat larger theater (by architect Ben Schlanger) these illustrate basic methods for the smaller theater as well. In the longitudinal section (below) may be seen the splaying of the ceiling to avoid sections parallel to the floor. Cross-section, seen to the right, shows acoustical offsets in the sidewall. (Projection portholes show in center.) Above is a construction detail for the "stadium" of the theater


3/4" COVER FOR WIRE FABRIC
4" STONE CONCRETE SLAB
STONE CONC. FILL
2"
2"
3/4" COVER FOR WIRE FABRIC
SLOPE AT REAR WALL


4" CINDER CONC. SLAB
GLAZED T.C. COPING
PRECAST 2" THICK GYPSTEEL SENIOR PLANK
ADJ BLDG
97-11
98-1
4" T.C. JIB
OPENING TO FAN RM
SUSPENDED CEILING: METAL LATH & GYPSUM PLASTER
CA = CORRUGATED ASBESTOS ON IRON FURRING
7'-0" MIN. CLEARANCE
97-6½
FURRING
PROJ. RM.
95-4
94-3
CA
CA
CA
91-10
89-3½
87-9
METAL FURRING LATH & PL.
CORRUGATED ASBESTOS ON IRON FURRING
SCREEN
80-11
80-7¼
80-1
79-7
79-1
78-7¼
78-1½
77-8
77-2½
76-9¼
76-4¼
74-2
74-3
1" CEM. FIN. ON 4" STONE CONC.
75-0
0
5
10
15
20
18 74-3
17 74-1½
16 74-0
15 73-10¾
14 73-9½
13 73-8½
12 73-7½
11 73-6¾
10 73-6
9 73-5½
8 73-5
7 73-5
6 73-5½
5 73-6
4 73-6¾
3 73-7¾
2 73-9
1 73-10½
74-0
ROWS
FILL

LONGITUDINAL SECTION

HEATING, VENTILATING & AIR CONDITIONING

IN A 400-SEAT theater the total heat generated by the occupants, when the house is filled to capacity, would be equivalent to the heat emitted by 668 sq. ft. of equivalent direct steam radiation or 1060 sq. ft. of hot water radiation. This total heat is produced by the audience during all seasons of the year with little or no variation (400 btu's per hour per person).

This quantity of heat, in addition to that from other sources, such as lights, fan motors, sun effect, etc., is objectionable during hot Summer weather. Ventilation alone cannot be wholly satisfactory when the outside air is already too warm and humid for comfort. Air conditioning, with provision for cooling and dehumidification, would then be required.

During the Winter season in most of the United States, the internally generated heat and moisture is easily removed by the introduction of sufficient outside air, suitably tempered, if necessary, to produce the desired results. During cold weather the quantity of outside air should be reduced to the minimum needed for odor control. Heating of this amount of outside air will be necessary at times so that its final temperature will be such as to maintain desired conditions. It will thus be observed that heating of a theater is actually often a process of controlled cooling.

BEFORE PATRONS ENTER

Prior to the admission of the first patron and during the time of small occupancy, sufficient heat must be provided to balance the net heat losses that will occur in most areas of the country in the winter time. Conventional methods of heating include the recirculation of a part or all of the air handled by the ventilating system raised to a sufficient temperature above 70° F. or by the use of direct radiation distributed strategically throughout the theater or by both methods simultaneously.

As the number of patrons increase, the need for heating may change to a need for cooling. This shift in requirements can be readily satisfied by the ventilating and heating systems provided means for adjusting the quantity of outside air and heat supplied thereto has been incorporated in the design of the equipment.

BOILERS, STEAM OR HOT WATER

An automatically fired steam or hot water boiler will prove satisfactory for the furnishing of the necessary heat for tempering the ventilation air as well as heat for lobbies, toilets, rest rooms, offices, etc.

The use of a hot water heating system in lieu of a steam system will often prove desirable, because under-floor, gravity returns are not needed for the proper operation of a hot water system. Also it is not necessary to provide a depressed boiler room or pump pit for a hot water system. Hot water systems do not require radiator or blast coil traps; and adequate zoning of the various portions of the theater is easily provided.

ZONING IS NEEDED

Because of the fact that heating will be required in the lobby, rest rooms, lounges, toilets, offices, etc. at the same time that cooling is needed in the auditorium, adequate means for zoning are indicated. The use of forced circulated hot water with individual, thermostatically controlled, motor operated circulators in the returns from each zone will satisfy this requirement with a minimum investment.

The installation of a suitable safety control to prevent the possibility of freezing the outside air heating coils in the event of failure of a part of the mechanical equipment would be necessary in the use of hot water. It should be pointed out, at this time, that steam systems, also, are vulnerable to damage from freezing, under certain conditions, and safety controls should be included in their design.

The projection booth and toilets must be ventilated by sufficient quantities of outside air, usually dictated by local codes or well established by general practice. Re-wind rooms, generator rooms, in fact, all interior occupied rooms, require some form of ventilation. (See projection room diagrams, page 115.)

THE QUESTION OF PANEL HEATING

Consideration has been given to the use of radiant or panel heating in theaters. The ever increasing interest in panel heating by the building industry and prospective building owners raises the question whether this form of heating may soon displace all other forms of heating systems in use today where a high degree of comfort is desired.

The more common forms of panel heating at present are constructed of grids or sinuous pipe coils buried in the concrete floors, in plaster ceilings or walls as required to provide sufficient heating areas. Hot water is circulated through these coils at relatively low temperatures at varying degrees to conform to the weather conditions. Wrought iron, copper and steel pipe coils are used, depending upon the several governing factors entering into the design requirements.

The ability of a floor type radiant panel to change its heat output rate as rapidly as necessary in the auditorium of a theater is questionable.

Because the need for heating is greatest when a theater is empty and probably non-existent when filled to capacity, it would appear that the added human comfort attributed to the use of radiant heating cannot be realized in this application. Careful analysis of all the factors affecting the design of the heating system should be made before deciding to install panel heating in the auditorium of a theater. The use of radiant heating in lobbies, toilets, lounges, rest rooms, etc. would probably be quite satisfactory and desirable.

ADIABATIC WASHERS

In some portions of the United States, where the Summer relative humidities are always low, adequate air conditioning may be realized, at a low cost, by the use of an adiabatic washer. The term "adiabatic" is descriptive of a process in which no heat is added to or removed from the medium being considered. In this system, outside air is caused to pass through a suitable spray type or capillary type washer in which the spray water is caused to recirculate through the spray nozzles. In passing through the water sprays, the air, initially at a high dry bulb temperature and low relative humidity, increases its moisture content by the evaporation of a part of the spray water. The heat absorbed by this evaporation is effective in lowering the dry bulb temperature of the air to a point close to its initial wet bulb temperature. This air can be used for air conditioning quite effectively where high dry bulb temperatures and low relative humidities are encountered. Its use is prohibitive, however, where high humidities prevail.

The possibility of digging a well and then finding insufficient water or water at too high a temperature offers a deterrent to the use of this type of system.

Among mechanical systems, the one common to the small theater consists of a reciprocating type compressor using freon-12 as the refrigerant and city water or an evaporative condenser for condensing purposes.

Direct expansion or water chilled cooling coils, depending upon the requirements of local codes, are used to cool and dehumidify the air.

THEATER LIGHTING

Although motion pictures are supposed to be seen "in the dark," auditorium lighting is important, involving

a. comfortable vision
b. safe movement
c. pleasant atmosphere.

During operation the main light is of course on the screen itself. The standard of screen brightness is set at 20 foot lamberts maximum to 5 foot lamberts minimum, depending upon the viewing angle. Since patrons do not look at a blank white screen, actual brightnesses are lower: an average of approximately 3 to 4 foot lamberts when black-and-white pictures are shown, and not over half of that for technicolor. Lighting levels in the remainder of the room must be carefully subdued to avoid interference with this relatively low absolute brightness.

In the most economical of arrangements, *spilled light* from the screen is depended upon for general illumination during the show. If sidewalls are lined with a material such as corrugated asbestos cement, the part of the light which strikes the wall is reflected chiefly in a lateral direction. It therefore illumines the seated patrons from the side, making them visible to newcomers without throwing light in their faces or fogging the screen.

Aisle lights attached to the end seat in every fourth or fifth row should produce a brightness of perhaps 2/10 foot lambert on the aisle carpet, the incident light being 3 or less footcandles. Exit lights according to code. For general lighting of the auditorium outside of projection line, reliance is now generally put on cove or offset lighting of incandescent, fluorescent or cold-cathode type, with provision for the occasional introduction of a spot. The architect should not forget the problem of access (by catwalk or otherwise) for cleaning and relamping.

As the audience enters the theater, or leaves again after the show, there is a problem of gradual adjustment of the eye over a very wide range of brightness values. In this process the light under the entrance canopy will play a small part in daytime when, regardless of artificial illumination, it will represent a lessening of brightness in contrast with the usually brilliant street.

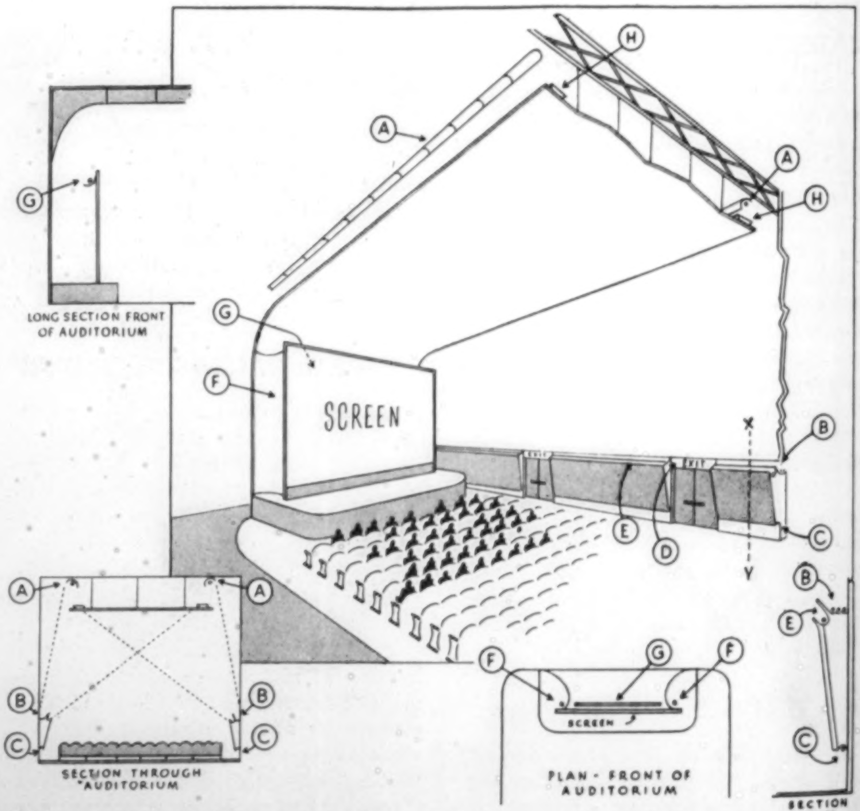
At night, however, depending on the surroundings, there will be a tendency to make this entrance light as brilliant as possible (closely spaced lines of cold-cathode light are a favorite expedient) and the progression from the foyer into the lobby must be rapidly downward. There are no "visual tasks" of any exacting kind along the way, so the general light distribution is all that counts, and very simple deeply recessed bowl reflectors in the ceiling will do most of the necessary work. A random pattern may be used, throwing emphasis wherever it is desired as a matter of showmanship. In the lobby and lounge the general illumination level need not be above 5 footcandles.

In washrooms and rest rooms, the illumination level should be somewhat higher (10 footcandles recommended) to encourage cleanly use of the facilities. At mirrors, 20 fc.

The subject of "black light" or ultraviolet illumination that is invisible until reflected by fluorescent finishes is not treated here, for the reason that we are dealing with an economical theater type achieved with essentials. Care must be taken to shield such sources completely from the eye; colors are a special range.

In lighting the theater as in all other aspects of theater design, the successful architect does well to recall that his best art will be art which conceals itself. *The show on the screen* is what the audience chiefly comes to see; this show costs the owner half of his gross income to buy; he is selling motion pictures not statuary or fountains; the best theater is the one from which the audience will go thinking the picture was good!

FULLY DEVELOPED LIGHTING technique for a somewhat larger theater, by C. M. Cutler of Nela Park Engineering Division, shows maximum use of auxiliary lighting. ***A****, illumination on forward sidewalls;* ***B****, floods on ceiling, also additional light on sidewall;* ***C****, wainscot aisle lights;* ***D****, exit lights;* ***E****, possible germicidal lights for air irradiation (these shine diagonally across ceiling);* ***F****,* ***G****, backlighting on the surround of the screen, with objective of softening the strain-creating contrast between the picture and the neighboring dark;* ***H****, catwalk for lighting maintenance. Courtesy, The Magazine of Light*


H
A
A
H
G
LONG SECTION FRONT OF AUDITORIUM
G
F
SCREEN
B
C
E
D
A
A
B
B
C
C
SECTION THROUGH AUDITORIUM
F
G
F
SCREEN
PLAN - FRONT OF AUDITORIUM
B
E
C
SECTION X-Y
X
Y

ACOUSTICS OF MODERN AUDITORIUMS

by Floyd Rowe Watson

Practically perfect conditions for speaking are realized when two people are conversing outdoors at a distance of about three feet. The sound is loud enough and, except for indistinct speaking, there is no distortion. If the distance between these people is increased, the conditions are not so perfect. The speaker must raise his voice and any nearby sounds begin to disturb the listening.

Requirements for music are not so exacting. Music is usually louder than speech so that it can be heard at greater distances, and there is also little question about intelligibility.

These ideal conditions are found to some extent in the Greek open-air theater. In such theaters, the speaker is aided by the reflections from the walls near him which allow him to "hear himself" and which amplify his voice by reflecting considerable sound to the audience. The listeners have the advantage of outdoor acoustics, which are generally regarded as good, provided the theater is in a quiet location.

It is a far cry from the Greek theater to the present-day auditorium, but the ancient structure has features that suggest acoustic improvements for the modern building. For example, the inadequate reflecting walls of the Greek theater might be amplified; but instead, the performer today is lost in a rather enormous stage house built primarily to accommodate voluminous scenery and the machinery for handling it. Provision is thus made for scenic and color effects, but apparently little consideration has been given to acoustics. It leads one to inquire about the real purpose of an auditorium.

Furthermore, the outdoor conditions of the Greek theater are not improved, for the surfaces needed to enclose the modern auditorium act as reflectors of sound and thus introduce possibilities for most of the acoustic defects — reverberation, echoes, resonance, interference and focusing. While the loudness is built up somewhat by reflected sound, the amount is small compared with the loudness of the direct sound; and any advantage is largely overshadowed by the defects of reflection.

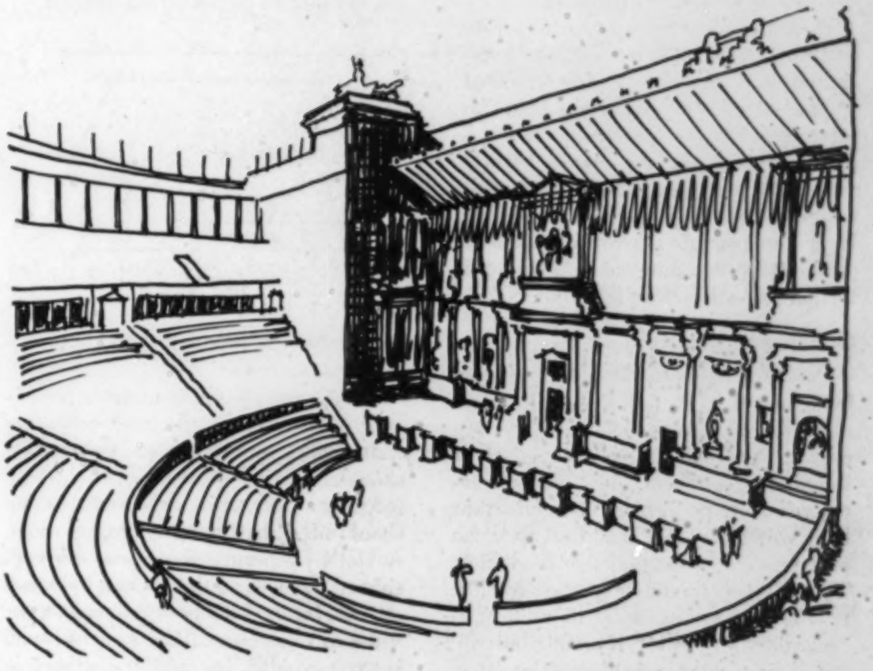


Fig. 1: The ancient open-air theater (this is the Roman theater at Ostia) often had excellent acoustics. Reflections from wall amplify voices, permit a speaker to "hear himself"

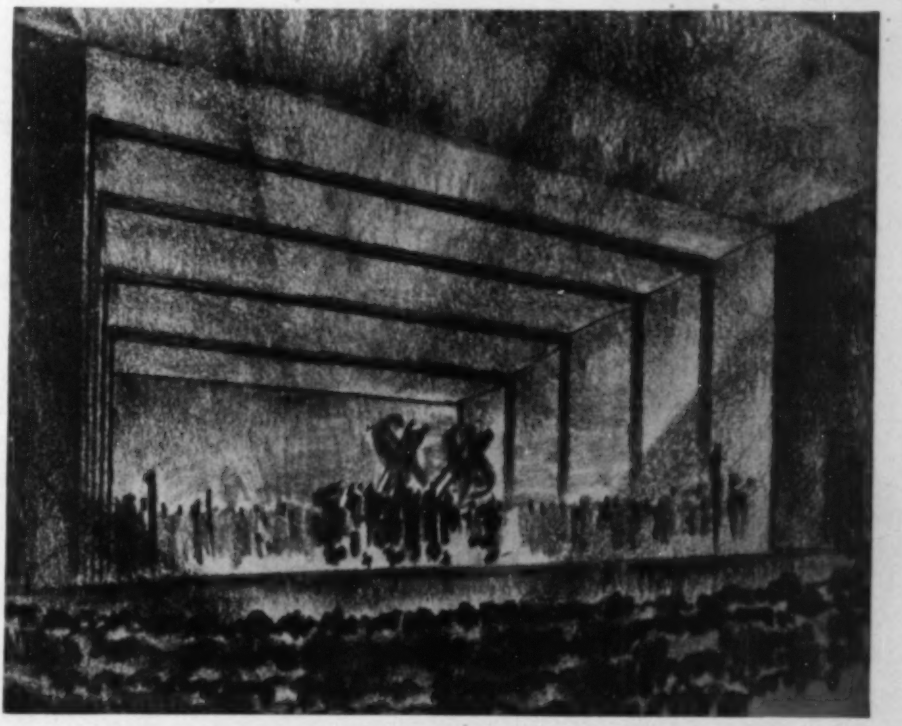


Fig. 2: Perspective of a proposed stage shell. Sides and ceiling are constructed in panels, slightly convex to diverge sound and produce a more uniform distribution on the stage

How to provide good acoustics

How then can good acoustics be provided? There are two requirements, equally important:

1. to adjust the stage for *generating sound* as perfectly as possible; and,
2. to design the auditorium for *comfortable and satisfactory listening.*

These two objectives present separate problems, which will be discussed presently. Complaints have been voiced that an auditorium properly adjusted for listening is too dead for music. The correct complaint, in the opinion of the writer, is that the stage arrangements do not provide enough reverberation. The ideal is to generate perfect sound effects on the stage that pass out into the auditorium for satisfactory listening.

Generation of sound

Performers should have reflecting surfaces near them by which they can hear themselves, and thus allow them to adjust speaking and music until it sounds best to them. Without such reenforcement, performers complain that their voices are "lost" and that they can only guess at what they are producing. The reflectors should be reasonably close to the performers, less than 28 feet, according to Petzold[*], if intelligibility of speech is to be obtained, and less than 24 feet for music. These reflecting surfaces should not be arranged in a box shape, because parallel walls tend to produce annoying resonances. Fig. 2 shows the perspective of a proposed stage shell. The sides and ceiling are constructed in panels, preferably slightly convex to diverge sound and produce a more uniform distribution on the stage than plane panels. The paneled sections decrease in size toward the rear. To accommodate different sizes of performances, the sides could be made of portable sections. The ceiling could be provided by canvas hangings in folds as shown in Fig. 3. When not in use, the canvas could be pulled up out of sight.

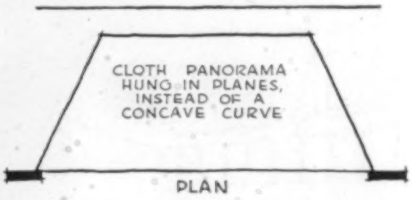


Fig. 4: A permanent panorama on canvas could form the rear reflecting wall, with side walls and ceiling to form a stage

Another possibility is to use a permanent panorama as the rear reflecting wall, but its curvature and inclination should be adjusted to avoid disturbing focusing effects. Side walls and a ceiling should be added to make a stage room. A cloth panorama could also be considered to serve as the rear and sides of a room, but it should not be hung in the usual concave curve if focusing of sound is to be avoided. It could be arranged as shown in Fig. 4. Canvas is preferred to velour for such a curtain because it is a better reflector and not so sound absorbent.

While it is desirable to provide a reverberant stage room for performers, the stage house space should be deadened to reduce stage noise by lining the stage house walls with cinder concrete tile, and treating the ceiling with a fireproof absorbing material, such as an efficient acoustic plaster. The cinder concrete is sound-absorbent, fireproof and paintable.

The acoustic problems of stages have been investigated by Burris-Meyer.[†] In one experiment, a performer talking into a microphone had his words directed back to him by a small loud speaker connected to the microphone. The performer found this "reflected" sound very helpful.

Hearing of sound

Three objectives are considered in getting satisfactory hearing conditions in an auditorium:

1. adequate absorption of sound,
2. reflecting surfaces designed to reduce echoes and focusing,
3. sufficient loudness.

Absorption of sound is accomplished by using upholstered seats, carpets, and acoustical materials applied to the walls and ceiling. The audience, because of the clothing worn, furnishes much absorption, but it is an uncertain factor so that the amount of absorption supplied for the empty room should be sufficient to make the auditorium largely independent of the number of auditors. Texts on acoustics of buildings give numerous examples of such adjustments.[‡]

Reflecting surfaces should be studied geometrically in the design stage of an

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[*] *Raum Akustik. See Watson, Acoustics of Building, third edition, page 92.*

[†] *Dramatic Use of Controlled Sound. Jour. Acous. Soc. Amer., 7, 74, 1935. Also, Science News Letter, May 17, 1941.*

[‡] *Knudsen, Architectural Acoustics; P. E. Sabine, Acoustics and Architecture Watson, Acoustics of Buildings.*

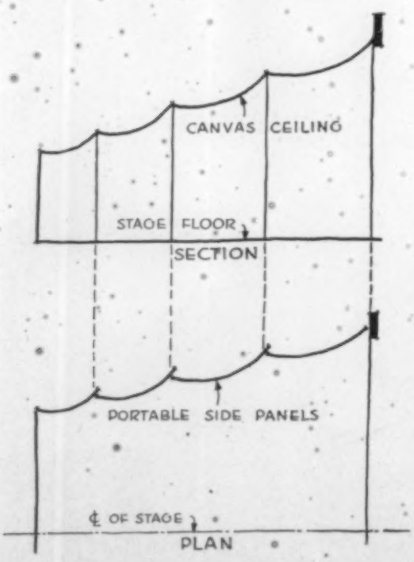


Fig. 3: Stage room made of portable side panels and canvas ceiling, with convex surfaces to diverge and distribute sound

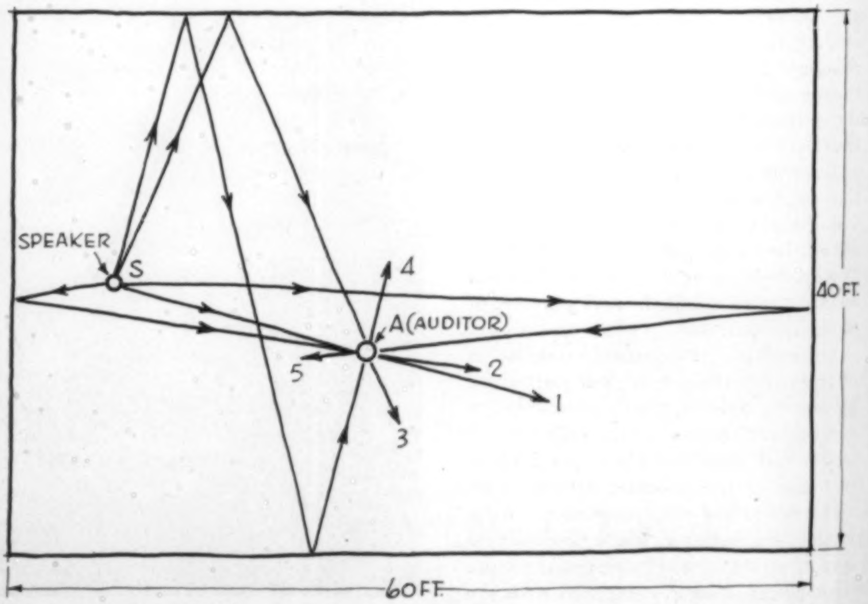


Fig. 5: When reflected sounds become stronger than the direct sound from the speaker, "dead spots" appear in auditorium. Short rays don't matter; longer ones blur sounds

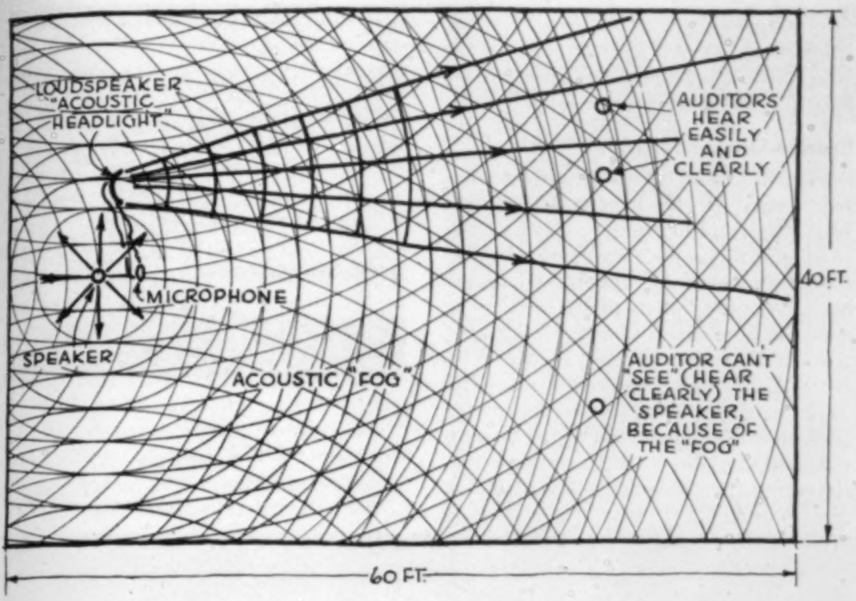

LOUDSPEAKER "ACOUSTIC HEADLIGHT"
MICROPHONE
SPEAKER
ACOUSTIC "FOG"
AUDITORS HEAR EASILY AND CLEARLY
AUDITOR CAN'T "SEE" (HEAR CLEARLY) THE SPEAKER, BECAUSE OF THE "FOG"
40 FT.
60 FT.

Fig. 6: The loud speaker acts as an acoustical headlight in piercing the fog of reverberant sound. Loud speakers would be arranged to send direct sound to all not near stage

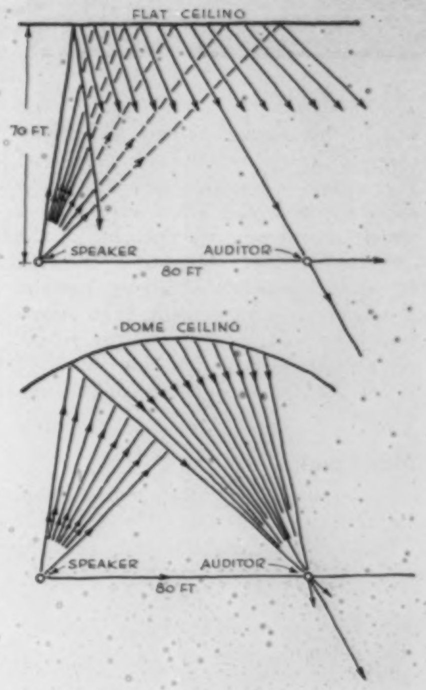


Fig. 7: A dome ceiling focuses sound, makes it louder than direct stage sound

auditorium, and arranged in shape and position to reduce possibilities of distortion of sound distribution. See illustration.

Sufficient loudness. The loudness of a sound obviously depends on the strength of the source and on the size of the room. Music usually has enough volume to be heard easily in most auditoriums, and band music can be too loud unless some of the more powerful instruments are subdued. Chamber music is generally supposed to sound best in rooms of rather small volume, and this would be true for the weaker passages of compositions. It seems likely, however, that special stage reflectors would allow chamber music to be given in larger rooms.

Speech differs from music in two respects — it is generally weaker than music and it must be intelligible to be understood. Speech must not be distorted by the room acoustics. Amplification usually is desirable for speaking, particularly since many listeners are hard-of-hearing. By means of loud speaker amplification, it is possible to use large auditoriums for all types of sound, weak or not, but the services of an intelligent expert are needed in the selection and adjustment of the high-fidelity apparatus required. In very large rooms, the question of vision becomes more important than the sound especially for auditors in the rear seats.

"Dead spots" in auditoriums

Fig. 5 shows typical rays of sound proceeding from a speaker S to an auditor A. Ray 1 travels the short distance from S to A and its sound is loud enough and intelligible. The same is true of rays 2 and 3 which have not traveled far and which reenforce ray 1 acceptably. But rays 4 and 5 have traveled 56 feet more than ray 1 and they tend to blur the speech somewhat, according to Petzold's experiments. For auditors further from the speaker, the hearing gets worse. The direct sound is weaker and the competition of the reflected sounds is greater, so that dead spots appear, which means that the intelligibility of the direct sound is largely lost. This conclusion was tested experimentally. The auditorium selected for test was empty and quiet; it had an acoustical ceiling and a padded carpet floor, but the side walls were of painted plaster and highly reflective. Speech became blurred at a position, rather sharply defined, about 26 feet from the speaker. In an auditorium with an audience and attendant general hum of noise, the blurring would doubtless be more marked. At the blurring point and beyond, a loud speaker would increase the direct sound and thus allow auditors to understand speech in spite of any disturbing reflected sound. An obvious improvement would be to deaden the side walls, also the rear wall to "kill" the reflection of the direct loud speaker sound. Figuratively, the loud speaker may be regarded as an "acoustical headlight" which pierces the "fog" of reverberant sound, as shown in Fig. 6.

Curved walls

Concave surfaces present an important acoustical problem, since they always concentrate sound, sometimes creating defects so serious as to make an auditorium unusable. Plane surfaces are safer, but even in this case some modification is desired by use of panels of acoustical material or other devices to break up the reflected sound. Fig 7 shows how a concave wall concentrates sound compared with a plane wall. Concave walls can be changed by convex

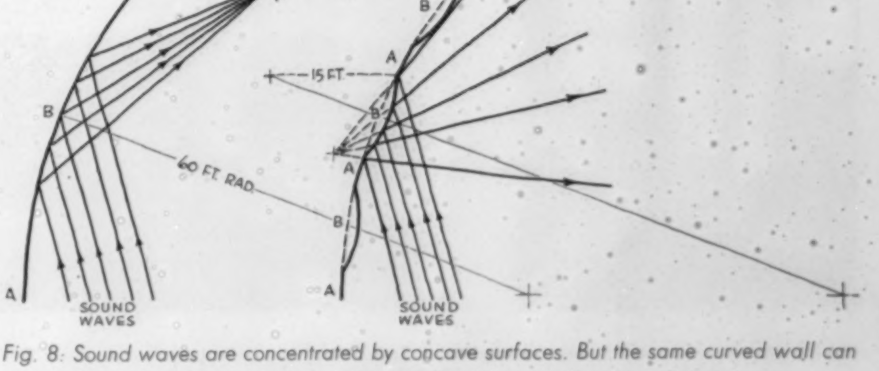


Fig. 8: Sound waves are concentrated by concave surfaces. But the same curved wall can be of alternate convex panels and flat panels of sound absorbing material

panels, by zigzag panels, by deeply recessed niches or false windows, etc. Fig. 8 gives a graphical presentation to show the diverging effect of a convex panel to overcome the focusing of the concave surface. Alternating convex panels with panels of absorbing material produces an arrangement that simultaneously scatters and absorbs sound. An arrangement of this kind was used in the Pentagon Building auditorium, Fig. 9.

Plane walls

Generally, large surface areas should be broken so that the reflected sound will be scattered and thus aid in getting more uniform distribution in a room. Acoustical material in decorative panels modifies the reflected sound and produces more absorption than if installed in a continuous area. Convex panels also serve beneficially in diverging the reflections. An unusual arrangement of convex surfaces is shown in Fig. 10, which pictures a small room used for listening experiments at RCA. For auditoriums, the convex panels may have a bulge at the center equal to about one-tenth of the panel span. In rooms with high ceilings, particularly churches, the side walls should be broken in some manner to minimize horizontally reflected sounds. Paneling is helpful, but architectural modifications, such as side balconies, recessed windows, etc., give more pronounced results. As a general rule, it should be remembered that "direct sound makes for clearness, reflected sound produces confusion."

Purdue University Music Hall

Figures 11 and 12 give the front and rear views of the Purdue University Music Hall auditorium. It is a large hall, seating 6,208 people. The sound absorption is furnished by upholstered seats, by a large area of carpeting and by a generous application of acoustical material on the rear walls and on the rear parts of the ceiling and side walls, with some paneling effects toward the stage. Reflection of sound from the curved rear wall was eliminated by constructing the surface in rectangular sections, backed

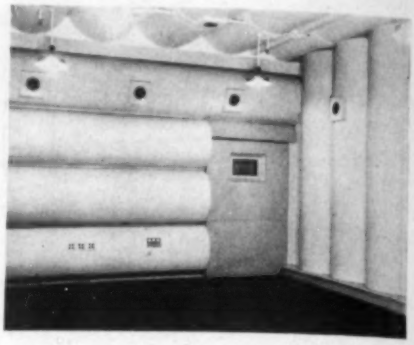
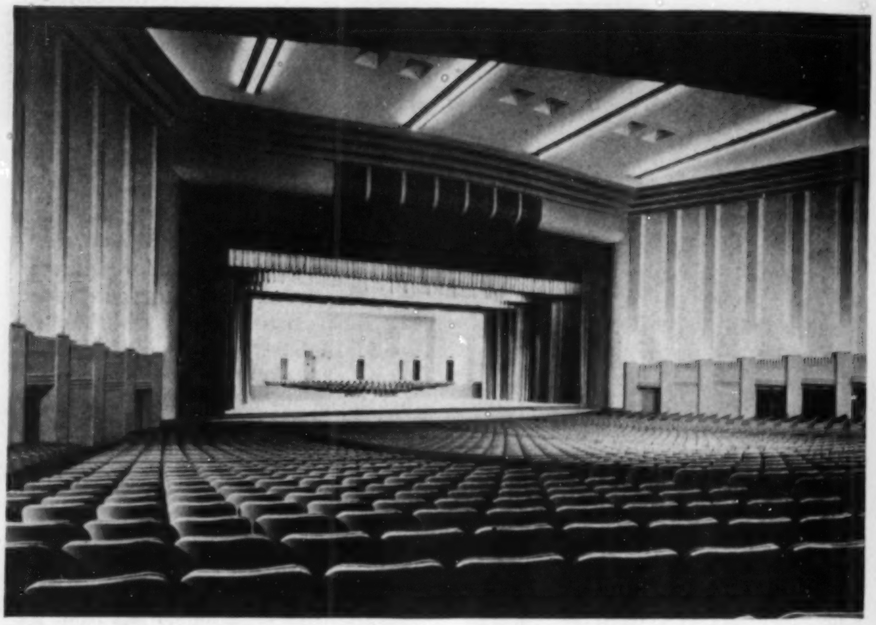


Fig. 10: An RCA listening studio: good sound distribution with convex panels



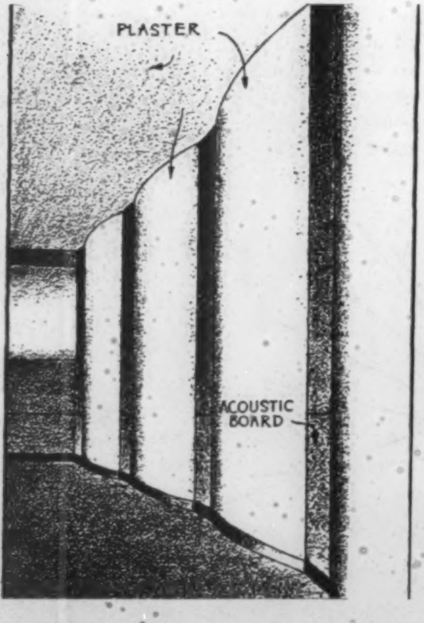


Fig. 9: The arrangement shown in Fig. 8 works well in the Pentagon Building

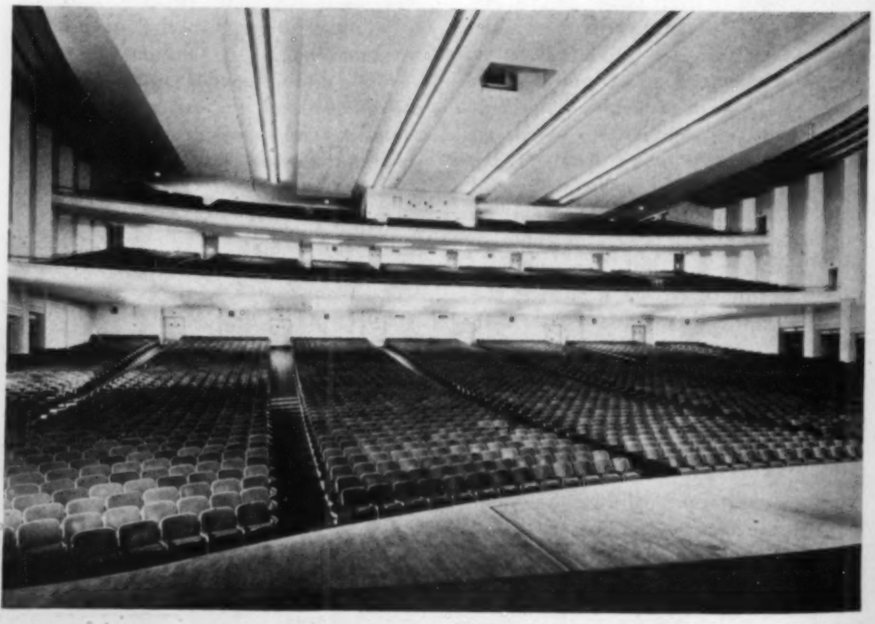


Fig. 11 and 12: Two views of Purdue University Music Hall, Walter Scholer, architect. Reflections broken by balconies, paneled rear wall surfaces, and sound-absorbing materials

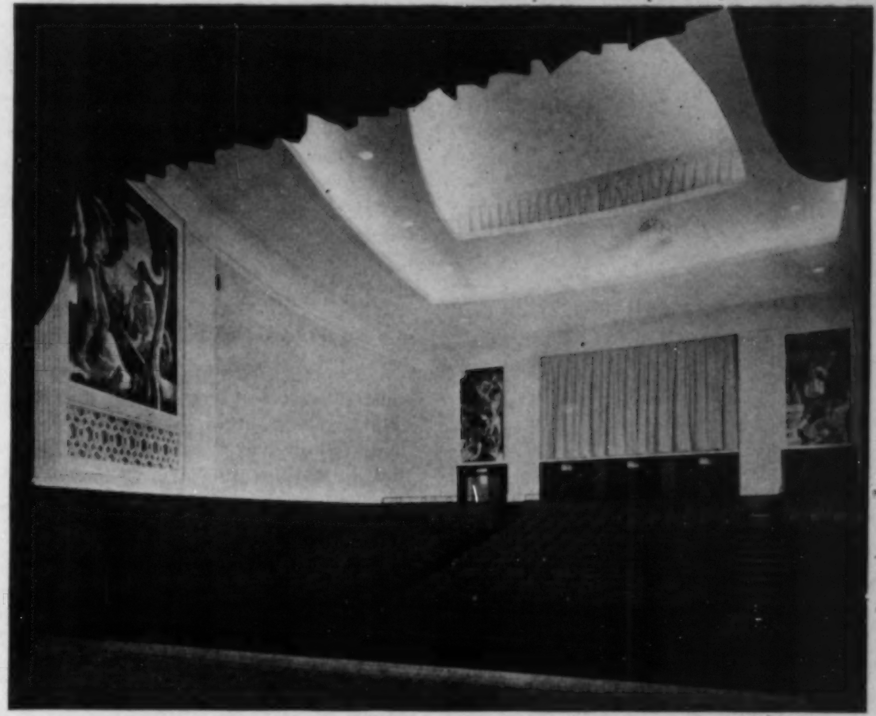


Fig. 15: Indiana University Theater. Walls funnel in toward the stage, walls and ceiling being paneled with sound-absorbing material and broken surfaces to control sound

by efficient absorbing material. The zigzag side walls, following generally the gentle curves narrowing the auditorium at the stage, were made up of short sections set at different angles, thus obviating the focusing effect of the curve.

A permanent band shell is located at the back of the stage, so that a band can participate in programs given on the stage. By means of a curtain, the shell can be cut off for band practice.

The basement of the building accommodates a number of rooms that required acoustic planning — a practice band shell, broadcasting studios with adjacent directive rooms, various offices and conference rooms. These rooms are constructed to be entirely soundproof, and the walls and ceiling literally float. There was some question whether or not the loud music would disturb meetings being held in the auditorium directly above these music rooms, so that a special insulation was constructed, as shown in Fig. 13. The building has been in use for six years, and the architect, Mr. Scholer, writes: "The acoustics have proved perfect in every respect, and strange as it may seem I have never heard one complaint either by a listener or performer."

Indiana University Auditoriums

The University of Indiana Hall of Music contains two auditoriums — a large one seating 4,000, the adjoining theater 400, and the stage space connecting the two halls 600, and the foyer linked with the stage by a public address system 500, making the total seating capacity 5,500. The sound absorption is supplied by upholstered seats, carpets and absorbing material on the walls and ceiling. The shape of the ceiling and side walls is determined by a series of elliptical surfaces diminishing in funnel fashion as they approach the stage to create the maximum in intimacy between the audience and the performers. The slope of the panels is such as to reflect sound efficiently to the audience. Rear seats are preferred by some auditors because of the good hearing conditions there. It was necessary to apply heavy padding on the ceiling panel over the orchestra pit to minimize some of the louder instrumental sounds, the reflections being shown in Fig. 14.

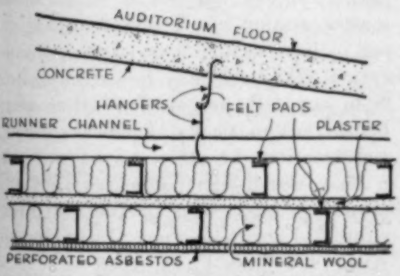


Fig. 13: A band practice room isolated from auditorium by double-hung ceiling

Arrangement for smaller audiences in the larger auditorium is made possible by means of a large acoustical curtain of heavy velour which is mechanically controlled and can be drawn across the auditorium at the front cross aisle, extending from ceiling to floor, thereby providing a seating capacity for 1,500 people. The curved side walls are broken by deeply recessed blank window spaces, backed by efficient absorbing material behind the grill work. One of the unique features of the building is a stage used by both auditoriums, but equipped with a heavy soundproof door that can be lifted for the transfer of scenery, and lowered in place when the auditoriums are being used simultaneously. Fig. 15 pictures the small theater auditorium which was adjusted acoustically by the methods already described.

Conclusion

It is obviously impossible in a short article to compress material that otherwise would fill a book. However, for the information of architects who plan auditoriums of either usual or unique design, attention has been called to some of the important things that should be considered in getting good acoustics, also to the objectionable features that should be avoided. The following list gives some important suggestions:

1. Make geometrical study of the interior surfaces of the room. Change the design or shape of those walls that will produce focusing of sound.

2. Modify large areas of walls or ceiling by panels of absorbing material, by convex panels, by grillwork backed by absorbing material, by balconies or other architectural features.

3. Provide enough sound absorption in auditorium in accordance with the usual rules, and install the greater part of it on surfaces remote from the stage. Upholstered seats are an important element in absorption.

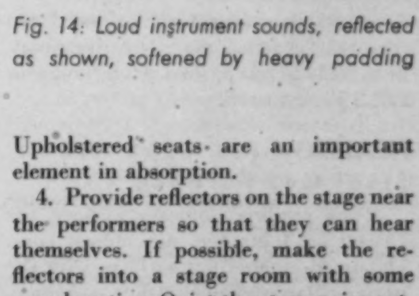
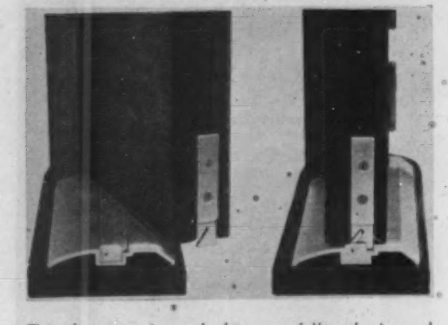


Fig. 14: Loud instrument sounds, reflected as shown, softened by heavy padding

4. Provide reflectors on the stage near the performers so that they can hear themselves. If possible, make the reflectors into a stage room with some reverberation. Quiet the stage noise outside this stage room by lining the stagehouse with absorbing material.

5. Provide a high-fidelity public address system.

PRODUCTS for Better Building



Trip-key equipped door saddle designed to seal out drafts, water automatically

DRAFT-PROOF SADDLE

To prevent water and drafts from entering, the pivoted center section of the *Weather-Tite door saddle* rises as the door is closed, and seals the space under the door. This action is accomplished automatically by a trip-key attached to the door. Saddle and door insert are made of high-grade aluminum alloy for strength and durability. There are no springs, cams or felts to require replacing. By use of this device considerable savings in heating and air conditioning costs are said to be effected. Standard lengths of 30, 32 and 36 in. are furnished to fit all doors. Columbia Industries, 19th Ave. & 36th St., Long Island City 3, N. Y.

COATED SHEATHING

The asphalted-gypsum core of the new *U.S.G. sheathing* is covered on both faces by a special water-resistant "Tripleseal" treatment. This process is stated to weatherproof the material so that it remains undamaged when drenched by the rain while piled on the job or nailed to the building framework. It has the fireproof qualities of all gypsum building products, as well as strength and stability. Tongue-and-grooved for wind-tight fit and rigidity, the sheathing eliminates the need for building paper. As the sheathing units may be readily scored and broken to size, and only four nails per stud are required for attachment, sheathing may be quickly accomplished. U. S. Gypsum Co., Chicago 6, Ill.

HEATING

Steel Gas Furnace

A new gas-fired domestic furnace, the *Bryant* steel furnace, has almost completely eliminated flat surfaces with the purpose of overcoming rattling and noise. Combustion chamber and heat exchanger have been arranged in updraft layout to prevent corrosion due to entrapment of condensate. The burner unit is rectangular to concentrate heat transfer without hot spots. Available for gravity or forced-air systems, the furnaces are rated 70, 90, 120 and 140,000 Btu. The Bryant Heater Co., Cleveland, Ohio.

Vacuum-Draft Furnace

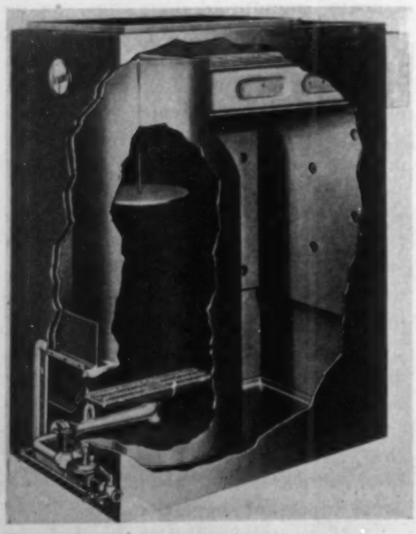
A new vacuum-draft oil-burning furnace eliminates the need for the standard chimney to create a draft. The *Norge-Heat* "chimneyless" furnace also filters and humidifies the heated air. It is designed to create its own draft with a suction fan which pulls air through the combustion chamber, an exhaust vent being substituted for the chimney. The furnace is being made available in three models, the largest having a bonnet output of 120,000 Btu. Norge-Heat Division, Borg-Warner Corp., Muskegon, Mich.

Packaged Heating Unit

New combustion principles and materials have been combined to eliminate the conventional boiler and hot water storage tank in the *Whirl-O-Magic* packaged heating unit. Steam or hot-water heat, and domestic hot water are reported to be produced instantaneously at high over-all efficiencies and at economical operating cost. Adaptable to either steam or hot-water heat, the unit is supplied with all necessary parts and controls, 3-pass horizontal high pressure steam unit, flash boiler and hot-water coils. The unit is 36 in. high, 42 in. long and 22 in. wide. Persiro Mfg. Corp., 38 Keer Ave., Newark 8, N. J.

Electric Wall Heater

To control the movement of warm air downward for more effective distribution, a directional grille front has been added to the *Thermador* electric-fan-type wall heater. Behind the heating element the unit contains a turbine type 16-blade fan driven by a 4-pole induction motor. For the circulation of air in summer, the fan may be used without the heating element. Models are made to fit easily between studs. Heaters are available with either manual or thermostatic control in 2, 3 or 4 KW models. Thermador Electrical Mfg. Co., 5119 District Blvd., Los Angeles 22, Calif.



A silently-operating gas-fired steel furnace

ANTI-STATIC GROUND

A new safety device, the *Hospital Electro-Static Grounding Intercoupler*, is being produced to provide a dependable means for grounding electricity in operating rooms. An inset 8 in. square brass box with a hinged cover has six sockets, which are connected through resistors to a water pipe ground. To lead off static charges during operations, bead chains covered with transparent plastic are plugged into the sockets, and are attached by various connections to equipment and personnel. A rack is supplied on which to hang the chain assemblies. Cannon Electric Development Co., 3209 Humboldt St., Los Angeles, Calif.

CALL-BACK INTERCOM

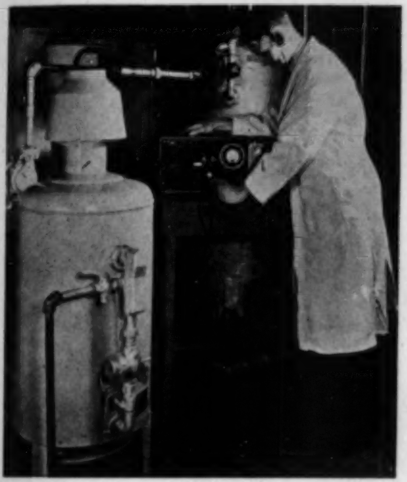
A combined call-back and sound reproducer unit, the *Executone C-18*, is designed especially for use with high noise level coverage industrial communication systems. In combination intercom and amplified voice-paging systems, it reproduces the paging call and permits the person called to reply and converse directly with the person originating the call. Anyone at an intercom master station can originate a paging call or have regular two-way communication. Call-back may be accomplished from any call-back station, other units being automatically silenced during conversation. At other master stations a busy signal light indicates that the system is busy, thus preventing interruption. Executone, Inc., 415 Lexington Ave., New York 17, N. Y.

STEEL CROSS-BRIDGE

The hard steel shaft of the self-adjusting *X-Bridge* is made to provide bracing of floor joists quickly and easily, and flexibility to accommodate changes in beam dimensions due to swelling and shrinking. The bridging consists of a light U-shaped member, with two points at the head joined by a curved section to build up progressive resistance as they penetrate into the beam. The heel has a curved cutting edge. To set the bridge, a head point is jabbed into the wood near the top of the joist, the heel is brought up about 1 in. above the bottom of the adjoining joist, and pushed across into position. The companion piece is similarly set. Installation can be done by unskilled labor. It is stated that natural wood shrinkages and floor vibrations imbed this bridging, and set it more firmly. Geo. E. Eichenlaub, 2519 Broadway, Beaumont, Texas.

GAS WATER HEATER

To effect rapid and efficient heat transfer, the heat exchanger of the *Smithway-Burkay* instantaneous water heater exposes 30 sq. ft. of heat transfer area to a total water content of only four pints. This unit is designed for use where hot water requirements are complicated by abnormal demands, intermittent peak loads, sterilizing heat, etc. Thermostatic control is said to hold water outlet temperatures within two degrees of the thermostatic setting. When installed with a tank, hot water up to 140° may be supplied from the tank, while water may be recirculated through the heater to supply water at 180° for sterilizing purposes. A. O. Smith Corp., Milwaukee, Wis.



Dual-heat instantaneous water heater

PLASTIC FLOOR TILE

Made of a material that has been proved in many other applications, *Koroseal* flooring embodies superior flame resistance and resistance to wear and weather. The product is made in square, flexible tile form unsupported by fabric. It is expected that the new flooring will be available in midsummer for installation where long wear and minimum maintenance are sought. A wide range of solid colors will be offered. Sloane-Blabon Corp., Trenton, N. J.

PLASTIC MESH GLAZING

In the new plastic-mesh *Vimlite*, developed to overcome the difficulty of obtaining the steel wire used as reinforcement in the original product, 20 per cent better light transmission has been achieved. The new product is credited by its manufacturers with having all of the virtues of its predecessor with regard to strength, lightness and being virtually weatherproof. Ultra-violet transmission is higher, and it has a more pleasing appearance. It can be cut with an ordinary knife or household scissors, and, because of a tendency to contract slightly, it has the ability to be self-fitting. Celanese Plastics Corp., 180 Madison Ave., New York 16, N. Y.

FLOOR MACHINE

A new machine developed for floor maintenance, the *Tennant all-purpose floor machine*, cleans, sands, waxes and polishes. Of rugged construction, it may be used on wood, asphalt, cork, linoleum and concrete, with either 8 in. or 16 in. accessories. A high torque motor operates the revolving drum and vacuum fan. The drum has a two-step pulley for speeds of 800 and 1400 RPM. Accessories include steel wool roll, steel wire brush, sanding drum, tampico or palmetto brush, and bar wax cartridge. G. H. Tennant Co., 2530 North Second St., Minneapolis 11, Minn.

WATER TREATING UNIT

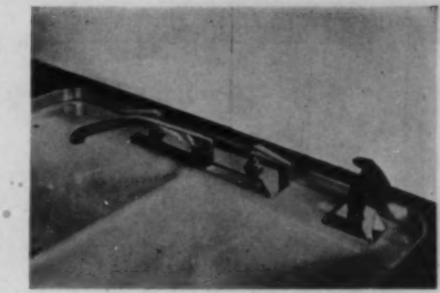
Rust and lime deposits in water supply are prevented by the *Micromet Feeder*, which feeds a specially prepared form of the phosphate compound, Calgon, into the water system at a uniform rate. Valves permit recharging without shutting off main supply. Effective on the incoming line of a hot water tank to prevent clogging of the heating coils, it can also be used with air-conditioning units, mechanical washers, or to protect the entire system. Sizes are available for domestic, commercial or industrial application. No-No Specialty Co., Quincy Ave. at East 69th St., Cleveland 4, Ohio.

GREASE INTERCEPTOR

Hydraulic filtering plus gravity differential separation accomplished by the new *HydraFilter grease interceptor* offers an efficient method of preventing grease-clogged drainage systems. Accumulated grease rises to a storage compartment away from the main current, and is free from solids, so that it is commercially salvageable. Heavy solids such as broken glass and china, bone fragments, etc., are retained in the trap. Special hand fasteners eliminate the use of tools for attaching the cover, which is of lightweight aluminum for easier handling during cleaning operations. Sizes are made for homes, restaurants, hotels, food processing and other industrial plants whose waste lines contain grease, fats or oils. Wade Mfg. Co., Elgin, Ill.

SWING SPOUT FAUCET

Fabricated from stampings and screw machine parts rather than castings, the *Commodore* ledge type swing spout kitchen faucet has been designed for maximum ease of cleaning, working clearance and radius of coverage. The lines are simple and modern. This fixture is equipped with the *Autospray* for rinsing, which is operated with one hand by applying slight pressure on the lever of the spray head. When pressure is relaxed, water-flow is automatically diverted to the spout. It is stated that the nozzle construction is such that it cannot clog, and always gives the same full spray. General Tire & Rubber Co. of Calif., 608 South Fair Oaks Ave., Pasadena 2, Calif.



Smoothline wide-swing swivel faucet

Space-saving sanitary duo-washfountain

DOUBLE WASHFOUNTAIN

The space-saving and sanitary features of the larger industrial models have been incorporated in the new *Bradley Duo-Washfountain* for general use in small plants, offices, schools, etc. This fixture has a spray-head which replaces four faucets, and enables two persons to be served at the same time. Besides the economy of space and the reduced number of piping connections, the fact that the spray is foot-treadle operated, and the bowl flushes itself automatically, offers sanitary advantages, since it is unnecessary for the hands to touch any part of the fixture. The bowl is furnished either in stainless steel or white enamel iron, with the pedestal panel which encloses the connections and mixer finished in the same material. Bradley Washfountain Co., North 22nd and West Michigan Sts., Milwaukee 1, Wis.

(*Continued on page 134*)

MANUFACTURERS' LITERATURE

CONVEYORS

Utilize the "Air Rights" of Your Ceilings. Overhead chain conveyor systems, their design and application to specific uses in various types of plant operations are discussed in this booklet. Typical layouts of assembly line installations are shown. The adaptability of the systems to old plant conversions is also given consideration. 20 pp., illus. Lamson Corp., Syracuse 1, N. Y.*

ELECTRICAL WIRING

Four Degrees of Home Electrification. Basic major equipment for the home is listed in four categories ranging from thrift to luxury, to conform electrical services with the means of the individual homeowner. For each degree of electrical living the circuit requirements and arrangement are indicated. Minimum wiring and outlet requirements. Suggested wiring specifications. 12 pp., illus. Westinghouse Electric Corp., Better Homes Dept., Pittsburgh 30, Pa.*

FACING SLABS

Mo-Sai Masonry Facing Slabs. Folder describes characteristics of precast masonry for exterior facing. Construction details for walls, spandrels and parapets. Methods of using slabs as exterior forms in poured concrete construction. Typical architectural specifications. Photographs of erection and completed installation in a variety of buildings. 8 pp., illus. The Dextone Co., P. O. Box 606, New Haven, Conn.*

FLOORING

Emeri-Crete, The Modern Concrete Industrial Flooring. Folder discusses use of emery aggregate cement flooring to provide long-wearing, nonslip surface required in industrial buildings. Shows many heavy-duty installations in plants where operations require extremely resistant flooring. 8 pp., illus. Walter Maguire Co., Inc., 330 West 42nd St., New York 18, N. Y.

HEATING AND HOT WATER

I-B-R Installation Guide—One Pipe Steam Heating Systems. Handbook for calculation and design of the domestic heating plant. Typical calculation sheet. Tables of heat loss factors for various materials, radiation and conversion tables. Recommended installation practice includes layouts and line drawings of details. Suggested control arrangements for systems using the various conventional types of firing. 16 pp., illus. The Institute of Boiler & Radiator Manufacturers, 60 East 42nd St., New York 17, N. Y. 25 cents.

Supertherm Systems. Details of an industrial process heating system which circulates superheated water under pressure are discussed in an illustrated folder. Analysis of advantages of the use of this closed type system as applied to a variety of processing industries. Tables give heat losses of steam due to flash-off, and comparative heat content of water and steam. 12 pp., illus. Blaw-Knox Co., Power Piping Div., Pittsburgh, Pa.*

Tankless Taco Water Heater for Residential Installations. Data sheet presents dimensions, capacities and installation details for four standard size residential water heaters. 2 pp., illus. Taco Heaters, Inc., 342 Madison Ave., New York 17, N. Y.*

KITCHENS

How To Make Your Kitchen Dream Come True. A complete line of metal kitchen sinks and cabinets is illustrated, and dimensions given. Various kitchen layouts are shown. Suggestions are offered for modernization schemes. 20 pp., illus. Mullins Mfg. Corp., Warren, Ohio.*

LIGHTING

Fluorescent Lamps and Auxiliary Equipments. Catalog lists dimensions, electrical data, lumen output and brightness of standard fluorescent lamps. Details and dimensions for auxiliary equipment are given. Hookup diagrams for various combinations of lamps. 6 pp., illus. General Electric Co., Nela Park, Cleveland 12, Ohio.*

Lighting That Attracts and Pleases. Ideas for the effective lighting of the exterior and interior of the modern restaurant. Construction details of cove, doorway, step and other special lighting features. 12 pp., illus. General Electric Co., Lamp Dept., Nela Park, Cleveland 12, Ohio.*

ORNAMENTAL METALWORK

Beautify and Protect with Metal Mouldings. A wide variety of mouldings and tubing in various metals and finishes is offered for use with composition wall surfacing materials. Detailed information is given regarding moulding dimensions and thicknesses of materials with which each type of moulding is designed to be used. 32 pp., illus. The Loxit Moulding Co., 1217 West Washington Blvd., Chicago 7, Ill.*

Catalog No. 5. Comprehensive catalog of architectural and ornamental metalwork. Metals included are iron, steel, brass, bronze and aluminum in rolled, cast, wrought and extruded forms. Classifications cover treillage, grilles, partitions, rails and balusters, ornaments, saddles, tubing and shapes. Sizes listed. Many full scale details of mouldings and forms. Installation and assembly details. Julius Blum & Co., Inc., 532 West 22nd St., New York 11, N. Y.

PAINT

Paint Progress, Vol. 6, No. 1. Interesting bulletin discusses: (1) effect of zinc oxide on properties of exterior paint; (2) value of color in wall treatments as educational aid; (3) characteristics of resin-oil emulsion paints; (4) improved luminescent paints. 12 pp., illus. The New Jersey Zinc Co., 160 Front St., New York 7, N. Y.

PERSPECTIVE AIDS

True Perspective Drawing Aids. Pamphlet presents information about special perspective scales, and perspective charts of planes and circles in space, designed to aid the draftsman in preparing accurate perspective drawings. 8 pp., illus. Chas. W. Downs & Son Co., Detroit 16, Mich.

REGISTERS AND GRILLES

Waterloo Air Diffusers. Data are given for the selection of grilles of proper capacity for both supply and return openings. A series of grilles, louvers and dampers is illustrated and described. Dimension tables. Installation details. 16 pp., illus. Waterloo Register Co., Waterloo, Iowa.

REPRODUCTIONS

Bruning Black and White Prints. A direct printing process for reproducing drawings and tracings is discussed, with emphasis on the possibility of printing on various weights of paper, and making changes on the finished prints. 4 pp., illus. Charles Bruning Co., Inc., 4754 Montrose Ave., Chicago 41, Ill.

SOLAR HOUSES

An Architectural Lift in Living. The theories and principles of design involved in the solar house. Charts and diagrams show the effects of orientation and solar angles. Table gives percentage of sunshine hours at various locations. Numerous drawings and photographs of interiors and exteriors of sun-seeking houses. 24 pp., illus. Libbey-Owens Ford Glass Co., Toledo, Ohio.*

STRUCTURAL STEEL

Otiscoloy High Tensile Steel. Technical information, suggested applications and other useful data about a

(Continued on page 148)

** Other product information in Sweet's File, 1946.*

IT'S WHAT'S *Inside* THAT COUNTS !

YOU JUDGE a camera on performance. And the precision-engineered parts *inside* the camera decide its quality of performance.

In building materials, too, it's what's *inside* that counts. For example—the long, wiry sugar cane fibres in the core of so many Celotex building and insulating products.

These closely-woven fibres imprison millions of minute air cells which create the ideal insulating qualities of Celotex board.

Examined under a magnifying glass, the serrations on each sugar cane fibre—more like bamboo than any other domestic fibre—look like small interlocking fishhooks. These multiple, matted, interlocking hooks are the reasons for the superior structural strength and durability of Celotex products.

All Celotex cane fibre products are specially processed to make them water and vermin resistant. All are easy to handle, easy to apply, economical to use.

Remember, too—on hundreds of thousands of jobs these Celotex products have *proved* beyond any doubt that they have the *inside* quality that counts.

Quick Facts on Celo-Siding

A typical Celotex cane-fibre building product

Ideal for most low-cost building. Does 4 jobs in *one* application: 1. Sheathing 2. Insulation 3. Exterior Finish 4. Structural Strength.

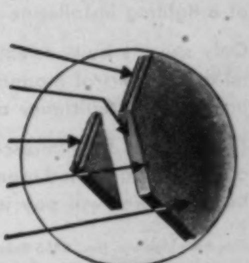
Tongue and Groove joint on long edges of 2′x8′ panels.

Core of genuine Celotex Cane Fibre Board furnishes structural strength and insulation.

All edges and sides sealed against moisture by coating of asphalt.

Extra coating of asphalt on exterior side.

Exterior surface of firmly imbedded mineral granules, providing durable, colorful finish.



Colors: Green or Bufftone.

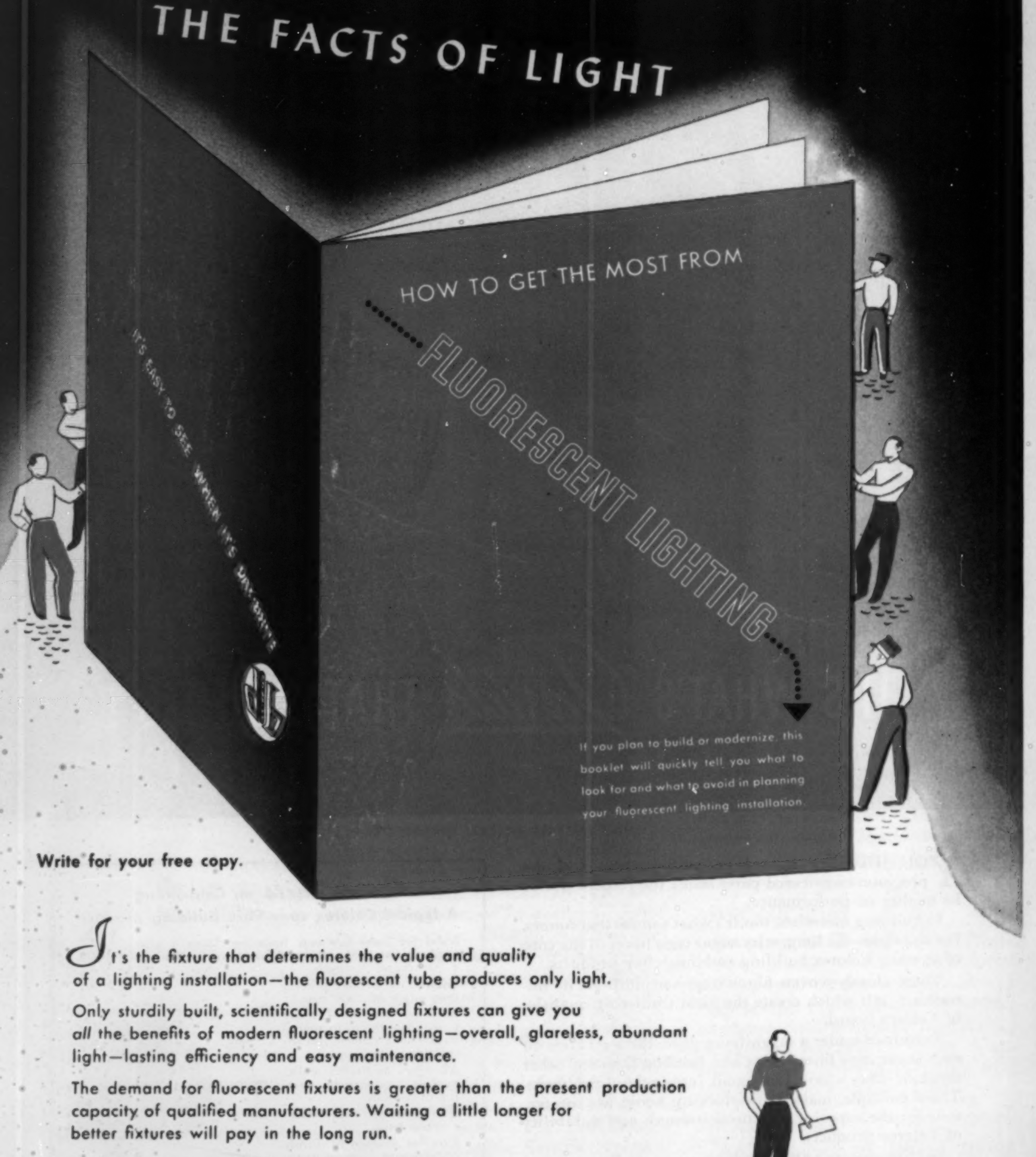
Sizes: ⅝″ thickness—4′ x 8′ with square edges. ⅞″ thickness—2′ x 8′ with T & G joints on long edges. ⅞″ thickness—4′ x 8′ and 4′ x 10′ with square edges.

CELOTEX

REG. U.S. PAT. OFF.

BUILDING PRODUCTS

THE CELOTEX CORPORATION • CHICAGO 3, ILLINOIS


THE FACTS OF LIGHT
IT'S EASY TO SEE WHEN IT'S DAY-BRITE
HOW TO GET THE MOST FROM
FLUORESCENT LIGHTING
If you plan to build or modernize, this booklet will quickly tell you what to look for and what to avoid in planning your fluorescent lighting installation.

Write for your free copy.

It's the fixture that determines the value and quality of a lighting installation—the fluorescent tube produces only light.

Only sturdily built, scientifically designed fixtures can give you *all* the benefits of modern fluorescent lighting—overall, glareless, abundant light—lasting efficiency and easy maintenance.

The demand for fluorescent fixtures is greater than the present production capacity of qualified manufacturers. Waiting a little longer for better fixtures will pay in the long run.

Day-Brite Lighting, Inc., 5465 Bulwer Ave., St. Louis 7, Mo.
Nationally distributed through leading electrical supply houses.
In Canada: address all inquiries to Amalgamated Electric Corp., Ltd., Toronto 6, Ontario

1068

IT'S EASY TO SEE WHEN IT'S

DAY-BRITE *Lighting*

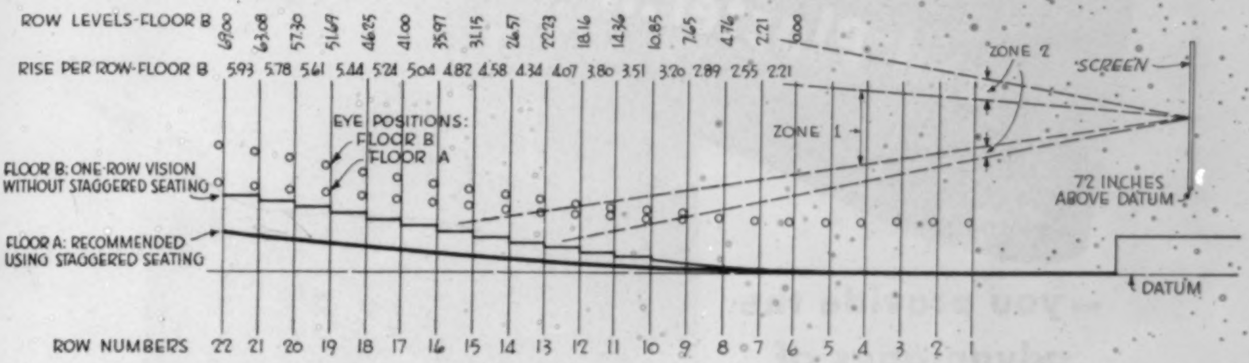
THEATER AUDITORIUM FLOOR SLOPES

Unit of reference in motion picture theater design is projection screen width, W. Distance from screen to first row of seats should be no less than 1 W. Best viewing distance is zone 3 W to 4 W; next in desirability are areas 2½ W to 3 W, and 4 W to 4½ W.

In theater of 22 rows, screen 11 ft. high by 15 ft. wide is good for maximum viewing distance; hence, first row of seats should be about 15 ft. from screen. Recommended row spacing at least 34 in. back to back.

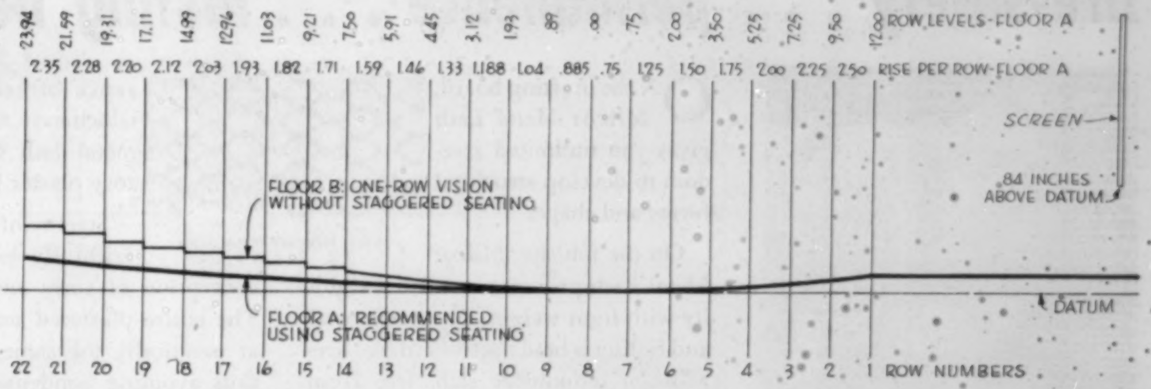
Upward floor slope should start as far back from screen as possible, since slopes greater than 3 in. between rows require risers. In diagrams shown, staggered seating, except in first rows of reverse-pitch schemes, reduces rear floor slope by half, and avoids dangerous variable step heights necessary with aligned seating. When steps are used, if uniform height (fixed by rear rows) is adopted as standard, slope increases, and stadium type scheme results. *Elevated* stadium type is useful to permit space beneath for passage and services.

Drawings show all levels in relation to datum line, lowest point of floor. All pitches and rises noted in inches and decimal parts of an inch.


ROW LEVELS-FLOOR B 69.00 63.08 57.30 51.69 46.25 41.00 35.97 31.15 26.57 22.23 18.16 14.36 10.85 7.65 4.76 2.21 0.00
RISE PER ROW-FLOOR B 5.93 5.78 5.61 5.44 5.24 5.04 4.82 4.58 4.34 4.07 3.80 3.51 3.20 2.89 2.55 2.21
EYE POSITIONS:
FLOOR B
FLOOR A
FLOOR B: ONE-ROW VISION WITHOUT STAGGERED SEATING
FLOOR A: RECOMMENDED USING STAGGERED SEATING
ZONE 1
ZONE 2
SCREEN
72 INCHES ABOVE DATUM
DATUM
ROW NUMBERS 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

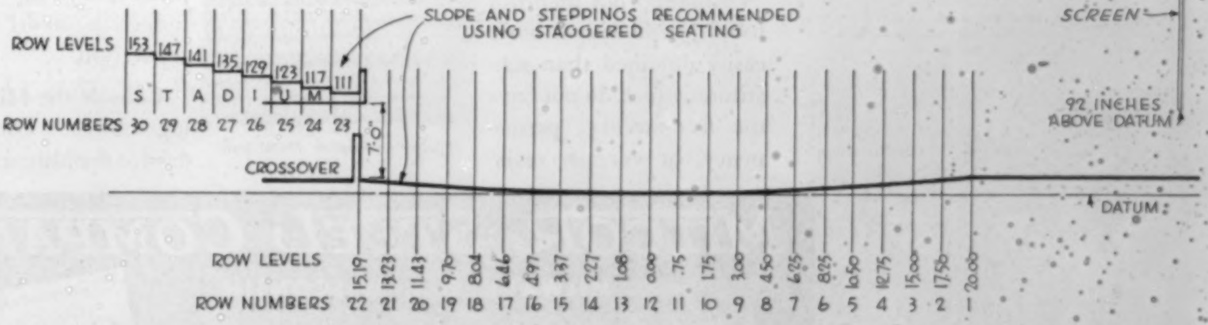
SINGLE SLOPE AUDITORIUM

On ground sloping 3 ft. or more downward toward screen. Without staggered seats, risers required starting tenth row.


ROW LEVELS-FLOOR A 23.94 21.59 19.31 17.11 14.99 12.96 11.03 9.21 7.50 5.91 4.45 3.12 1.93 .89 .0 .75 2.00 3.50 5.25 7.25 9.50 12.00
RISE PER ROW-FLOOR A 2.35 2.28 2.20 2.12 2.03 1.93 1.82 1.71 1.59 1.46 1.33 1.188 1.04 .885 .75 1.25 1.50 1.75 2.00 2.25 2.50
SCREEN
84 INCHES ABOVE DATUM
FLOOR B: ONE-ROW VISION WITHOUT STAGGERED SEATING
FLOOR A: RECOMMENDED USING STAGGERED SEATING
DATUM
22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 ROW NUMBERS

DOUBLE SLOPE AUDITORIUM

On level ground, or on ground sloping of less than 3 ft. in any direction. First six rows aligned to allow view of entire screen.


SLOPE AND STEPPINGS RECOMMENDED USING STAGGERED SEATING
ROW LEVELS 153 147 141 135 129 123 117 111
S T A D I U M
ROW NUMBERS 30 29 28 27 26 25 24 23
7'-0"
CROSSOVER
SCREEN
92 INCHES ABOVE DATUM
DATUM
ROW LEVELS 15.19 13.23 11.43 9.70 8.04 6.46 4.97 3.37 2.27 1.08 0.00 .75 1.75 3.00 4.50 6.25 8.25 10.50 12.75 15.00 17.50 20.00
ROW NUMBERS 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

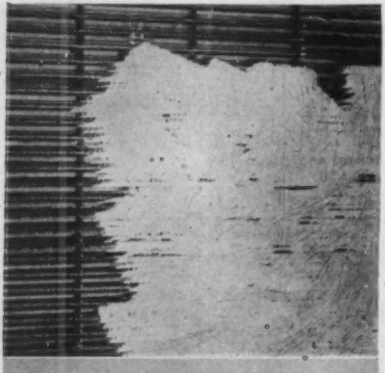
DOUBLE SLOPE AUDITORIUM WITH STADIUM

On level ground or on ground sloping less than 3 ft. in any direction. Seats in at least first six rows aligned. Crossover under first few rows of stadium saves seating area. Staggered seating, and minimum clearance in crossover, prevent intermediate steps.

Where your plans specify walls and ceilings of MILCOR Metal Lath and Plaster...

—you provide the advantages of

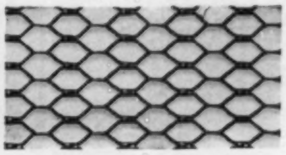
fire-safety . . . permanence . . . lasting beauty



• Above: The scratch coat is forced through Milcor Metal Lath, so that it is keyed on both sides of the steel reinforcing.

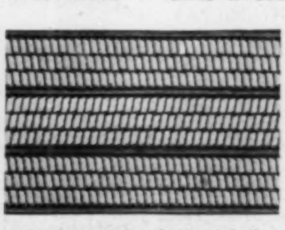
• Below: Note how the back surface of plaster on Milcor Metal Lath becomes permanently "clamped" to the steel.

ON the drafting board, Milcor Metal Lath gives you unlimited freedom to develop structural forms and shapes.



Milcor Netmesh Metal Lath

On the job site, Milcor Metal Lath provides maximum rigidity with light weight. The whole wall and ceiling is held together in one fire-resistant monolithic slab, free from cracking, warping, and shrinking tendencies.



Milcor Specialmesh Metal Lath

Although not plentiful today, metal lath is more easily obtained than substitutes which do not have the fire-safety, permanency, or vermin-resistance of steel . . . and which have never equalled metal lath as a satisfactory plaster base.

Steel-reinforced plaster faithfully expresses your conception of form and color tone. The entire plastered surface remains at practically the same temperature, thus avoiding condensation and resultant plaster blemishes such as lath streaks. The plaster stays new-looking longer, a credit to your reputation.

Consult the Milcor catalog in Sweet's. Or write today for the Milcor Manual.

F-268

MILCOR STEEL COMPANY

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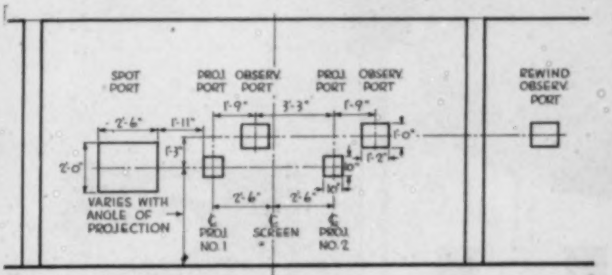
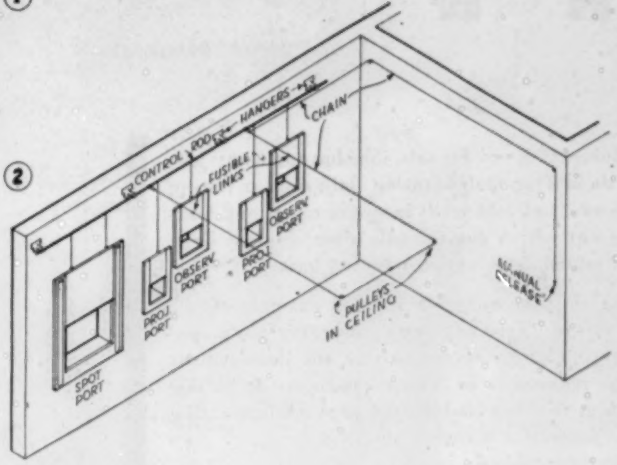
KANSAS CITY 8 MISSOURI • LOS ANGELES 23, CALIF.
ROCHESTER 9, NEW YORK

. . . additional service through
THE J. M. & L. A.
OSBORN Co.
A Division of Milcor Steel Company
CLEVELAND 14, OHIO
Detroit 2 • Buffalo 11 • Cincinnati 25

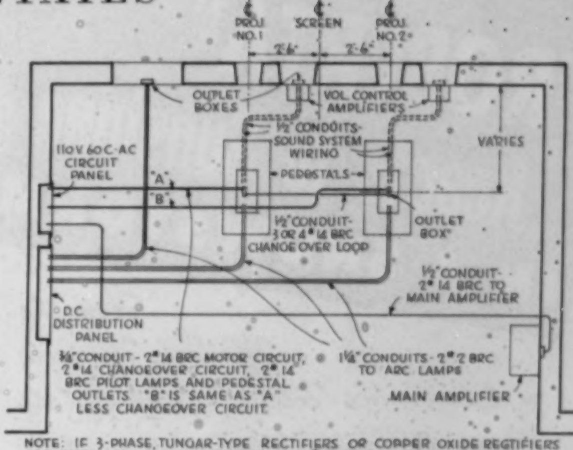
PROJECTION ROOM DETAILS


SPOT PORT
PROJ. PORT
OBSERV. PORT
PROJ. PORT
OBSERV. PORT
REWIND OBSERV. PORT
2'-6"
1'-11"
1'-9"
3'-3"
1'-9"
1'-0"
2'-0"
1'-3"
1'-2"
10"
10"
2'-6"
2'-6"
VARIES WITH ANGLE OF PROJECTION
℄ PROJ. NO. 1
℄ SCREEN
℄ PROJ. NO. 2

①

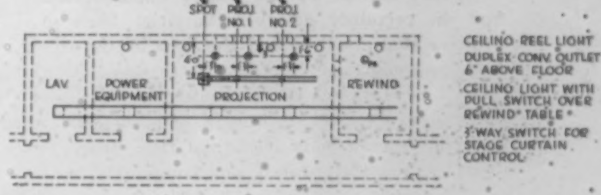

CONTROL ROD
HANGERS
CHAIN
FUSIBLE LINKS
OBSERV. PORT
PROJ. PORT
OBSERV. PORT
PROJ. PORT
SPOT PORT
PULLEYS IN CEILING
MANUAL RELEASE

②

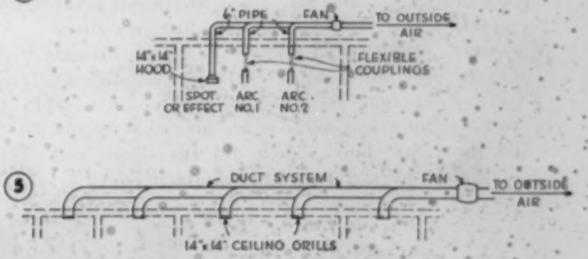

℄ PROJ. NO. 1
℄ SCREEN
℄ PROJ. NO. 2
2'-6"
2'-6"
OUTLET BOXES
VOL. CONTROL AMPLIFIERS
½" CONDUITS-SOUND SYSTEM WIRING
110 V. 60C-AC CIRCUIT PANEL
"A"
"B"
PEDESTALS
VARIES
½" CONDUIT-3 OR 4 #14 BRC CHANGEOVER LOOP
OUTLET BOX
½" CONDUIT-2 #14 BRC TO MAIN AMPLIFIER
D.C. DISTRIBUTION PANEL
¾" CONDUIT - 2 #14 BRC MOTOR CIRCUIT, 2 #14 CHANGEOVER CIRCUIT, 2 #14 BRC PILOT LAMPS AND PEDESTAL OUTLETS. "B" IS SAME AS "A" LESS CHANGEOVER CIRCUIT
1¼" CONDUITS - 2 #2 BRC TO ARC LAMPS
MAIN AMPLIFIER

NOTE: IF 3-PHASE TUNGAR-TYPE RECTIFIERS OR COPPER OXIDE RECTIFIERS ARE INSTALLED, A RELAY CIRCUIT OF 2 #12 BRC MUST BE RUN DIRECT FROM EACH RECTIFIER TO EACH PEDESTAL. THIS CIRCUIT NOT SHOWN.

③


℄ SPOT
℄ PROJ. NO. 1
℄ PROJ. NO. 2
LAV.
POWER EQUIPMENT
PROJECTION
REWIND
CEILING REEL LIGHT
DUPLEX CONV. OUTLET 6" ABOVE FLOOR
CEILING LIGHT WITH PULL SWITCH OVER REWIND TABLE
3-WAY SWITCH FOR STAGE CURTAIN CONTROL

④

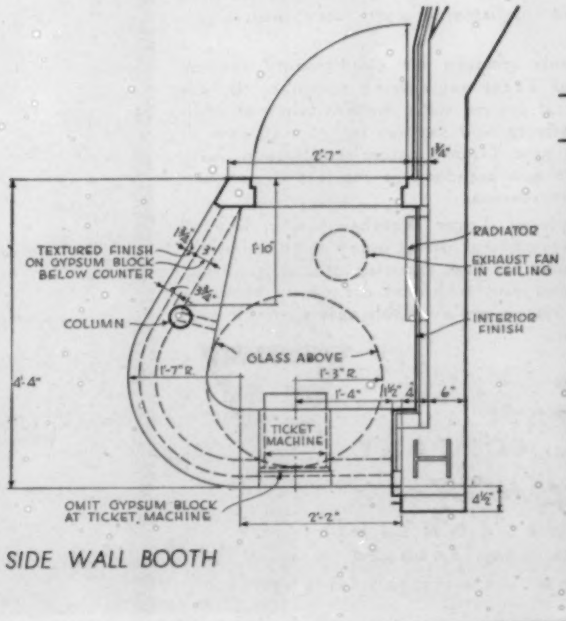

6" PIPE
FAN
TO OUTSIDE AIR
14"x14" HOOD
FLEXIBLE COUPLINGS
SPOT OR EFFECT
ARC NO. 1
ARC NO. 2
DUCT SYSTEM
FAN
TO OUTSIDE AIR
14"x14" CEILING GRILLS

⑤

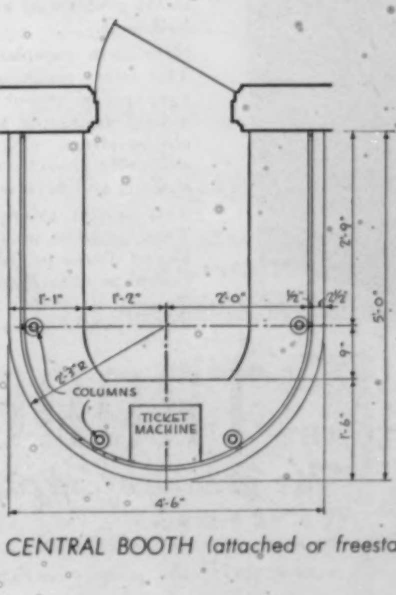
Fig. 1. *Front Wall Plan*
Fig. 2. *Porthole Shutter System*
Fig. 3. *Floor Plan and Wiring*
Fig. 4. *Ventilation Plan*
Fig. 5. *Equipment and Room Duct Systems*

TICKET BOOTH LAYOUTS

Service requirements: (1) Public and intercommunicating telephones; (2) Lighting; (3) Heating; (4) Ventilation

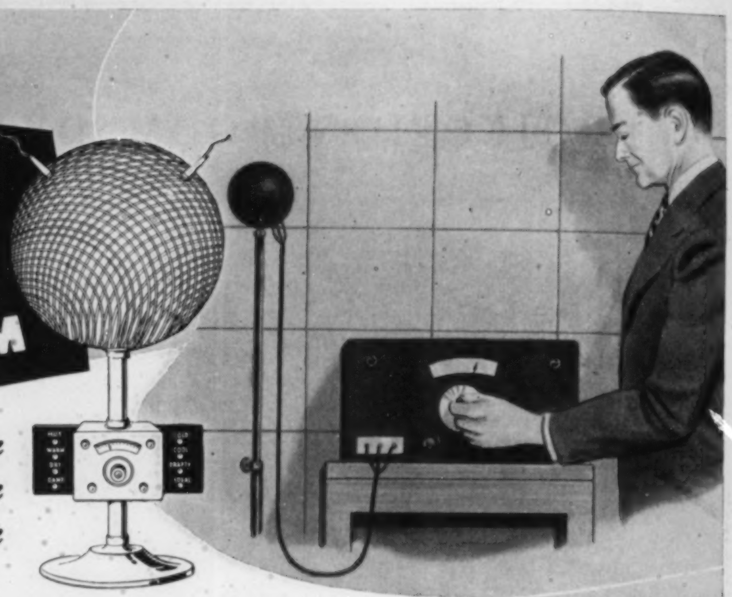

2'-7"
1¾"
1½"
3"
TEXTURED FINISH ON GYPSUM BLOCK BELOW COUNTER
3¾"
1'-10"
RADIATOR
EXHAUST FAN IN CEILING
INTERIOR FINISH
COLUMN
GLASS ABOVE
1'-7" R
1'-3" R
1'-4"
1½"
4"
6"
4'-4"
TICKET MACHINE
H
4½"
OMIT GYPSUM BLOCK AT TICKET MACHINE
2'-2"

SIDE WALL BOOTH


1'-1"
1'-2"
2'-0"
½"
2½"
2'-9"
5'-0"
9"
1'-6"
2'-3" R
COLUMNS
TICKET MACHINE
4'-6"

CENTRAL BOOTH (attached or freestanding)

"ROBERTA" Reacts to Sunshine IN A SNOWSTORM



How the Modern Miracle of Electronics Helps Trane Create Better Weather Magic . . .

"Roberta," the human-comfort meter, is one of the prima donnas of the Trane Laboratories. And she certainly deserves the title. She's so sensitive that she'll record the heat of the sun during a snowstorm. Or react to the air motion created by a wave of the hand. She measures the factors that affect human comfort better than the human body itself and then proceeds to record them accurately and completely.

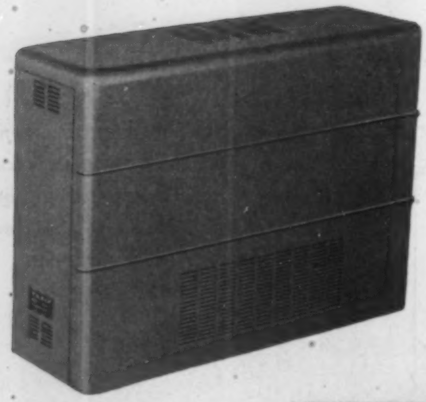
When Trane engineers in the development of new heating systems wanted to know just what made a person comfortable they had two alternatives. They could take a score of human guinea pigs and subject them to all kinds of heat, wind and sun effects or they could turn to electronics and make a machine that would do the same thing. They did the latter and created "Roberta," the Eupatheometer.

"Roberta" is not for sale. She has too many jobs to do in Trane laboratories. Jobs such as testing the effect of cold walls in warm rooms and finding out what's comfortable about radiant heat, convected heat, and conducted heat.

The Eupatheometer is another example of the genius of Trane engineers who carry out a constant program of research in the development and refinement of Trane products. It is this genius that has contributed so much in creating more effective Weather Magic.

More than 200 Trane field engineers in principal cities all over the country cooperate with architects, engineers, and contractors in the application of Trane systems. National advertising is advising customers to secure Trane information from architect, engineer, or contractor.

Now! A POST-WAR TRIUMPH OF TRANE ENGINEERING . . . THE TRANE CUSTOM-AIR SYSTEM

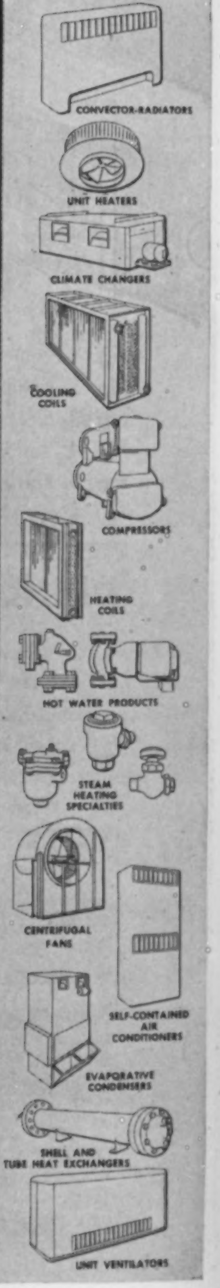


Another Trane FIRST can now be announced! Trane research engineers have worked for ten years to perfect the new Trane Custom-Air System — the ideal solution to the problem of air conditioning multi-story, multi-room buildings.

Here is a completely modern air conditioning system. This latest result of Trane engineering combines the advantages of a central system with the flexibility of individual units, and affects new savings in space in new or old buildings. The new Trane Custom-Air System *automatically* provides a new standard of comfort — summer, winter, and between seasons.

This newest example of Trane Weather Magic, like all Trane systems, makes efficient use of many of the complete line of Trane products for heat transfer and air handling. Complete information and technical details on the new Trane Custom-Air System are available only through your Trane field engineer.

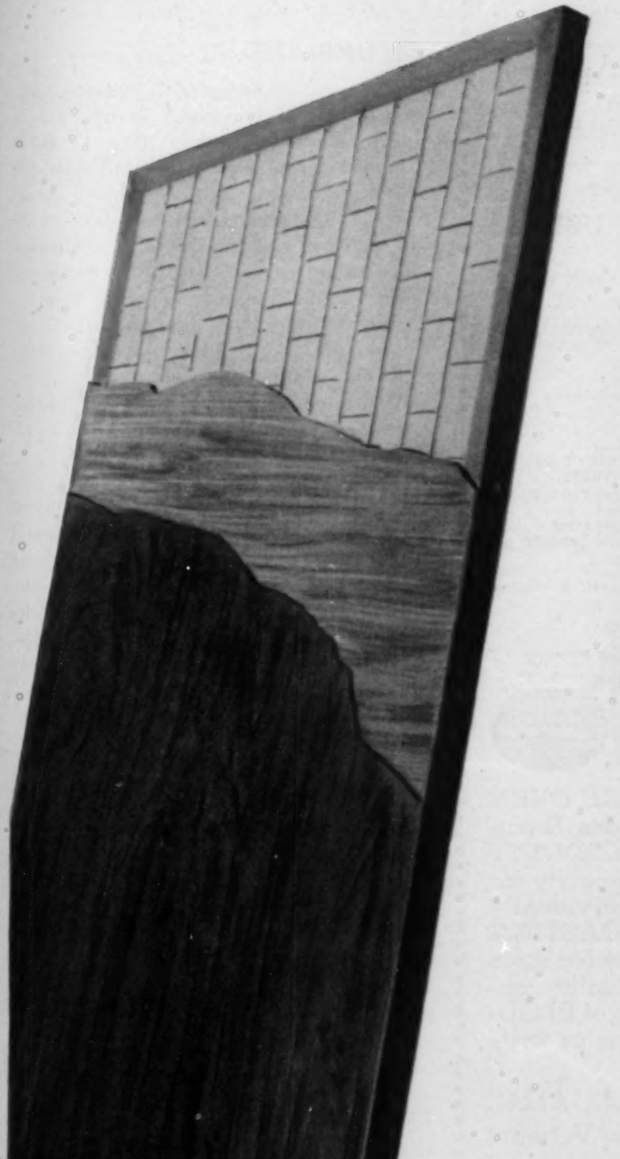
THE **TRANE** COMPANY
The House of Weather Magic
LA CROSSE • WISCONSIN
TRANE COMPANY OF CANADA, LTD., TORONTO
MANUFACTURING ENGINEERS OF HEATING AND AIR CONDITIONING EQUIPMENT



Roddiscraft

doors in Michigan Maple

A combination of Beauty and Toughness



HARD Michigan Maple faces over RODDISCRAFT cores and crossbanding welded into a solid, waterproof unit, under heat and pressure, by the RODDISCRAFT process, creates a door that will stand up under heavy traffic and harsh treatment.

In contrast to the delicate color and warmth of Michigan Maple, is its ingrained hardness—resistance to chipping and scuffing—which makes it an ideal wood for facing doors used in public buildings.

Roddis offers the pick of Michigan Maple from its 30,000-acre northern Michigan tract—selected and cut by Roddis woodsmen—matched and finished by Roddis craftsmen.

Specify RODDISCRAFT Doors in Michigan Maple to get long life and lasting beauty. Available in selected white, or unselected for painting. Consult your local millwork and fixture manufacturers—and lumber dealers.

Roddiscraft
Roddis Lumber & Veneer Co.
MARSHFIELD, WISCONSIN

Roddiscraft WAREHOUSES

CAMBRIDGE 36, MASS., 229 Vassar St.
CHICAGO 8, ILL., 1440 W. Cermak Rd.
CINCINNATI 2, OHIO, 457 E. Sixth St.
DALLAS, TEXAS, 2615 Latimer St.
KANSAS CITY 8, MISSOURI, 2729 Southwest Blvd.
LOUISVILLE 10, KENTUCKY, 1201-5 S. 15th St.
LONG ISLAND CITY, N. Y., Review and Greenpoint Ave.
MARSHFIELD, WISCONSIN
MILWAUKEE 8, WIS., 4601 W. State St.
NEW YORK CITY 18, NEW YORK, 515 W. 36th St.
SAN ANTONIO, TEXAS, 727 N. Cherry St.

DEALERS IN ALL PRINCIPAL CITIES

Consult Your Local Millwork and Fixture Manufacturers — and Lumber Dealers

(*Continued from page 125*)

HOME STEAM OVEN

A low pressure steam oven using less than one pound of pressure, the *Vendo 4th Zone*, is being readied for introduction to the public after two years of research. Both temperature and pressure are controlled automatically by a springless valve. Foods prepared in this gas-operated steam oven are said to be ready to serve much more rapidly than with other methods, and with savings of up to 40 per cent in minerals and vitamins. The unit may also be used for sterilizing and preserving. When field tests are completed, it will be offered for domestic use in a self-contained floor model or built in as part of a standard-size range. The Vendo Co., 1907 Grand Ave., Kansas City 8, Mo.

LIQUID PAINT BOND

To prepare glossy finished surfaces for covering coats, and for removing wax and grease, *Bull Dog Hold Tite* is recommended. Wiping with this liquid cleans the surface, and removes gloss of paint, enamel and varnish, to give a firm grip to new coats. Addition to new paint in the ratio of ¼ pint of the liquid to a gallon of paint, it is claimed, will bind new paint more securely to old finishes. Gillespie Varnish Co., Dey & Howell Sts., Jersey City 6, N. J.

TUBULAR LATCH

In order to give greater strength and service at low cost, the *Corbin tubular latch* has been redesigned, and more rugged parts adopted. Made for fast and easy installation, it also conforms to the Fir Door Institute specifications for use in premortised doors. When this latch becomes available in the near future, there will be a variety of designs, including a standard set, a closet door set, and a bedroom or bathroom set made with a locking button and emergency key. P. & F. Corbin, New Britain, Conn.

ILLUMINATED PLATES

In addition to the switchplate previously announced, which incorporates a tiny, neon-type safety glow lamp, a *LumiNite* safety plate for wall-type duplex convenience outlets is being introduced. The plate is molded plastic with a sealed-in glow lamp, said to consume less than two cents worth of current per year. Making it easy and convenient to plug in lamp and appliance cords in darkened or obscured areas, the plate also is a permanent safety light at night. Associated Projects Co., 80 East Long St., Columbus 15, Ohio.

MATCHED METAL TRIM

Balanced production is being maintained on a series of matching metal trims to assure availability for making complete installations with a single design. The *Chromedge* group includes designs for wainscot caps, wall panel strips, corner and cove base trims. Sizes are available for linoleum, tile, rubber, wall board and plywood. B. & T. Metals Co., 425 West Town St., Columbus, Ohio.

SAFETY STAIR TREAD

For safety and protection, the *Double-Duty Stair Tread* covers stair treads and risers with a single rubber mat which wraps around the nosing. Scored to give non-slip grip, the pad protects steps against wear from foot traffic, and risers against kicking and scuffing. The mats are made in 18 in. and 24 in. widths, and will cover a 9 in. tread plus a 7 in. riser. American Mat Corp., 1797 Adams St., Toledo, Ohio.

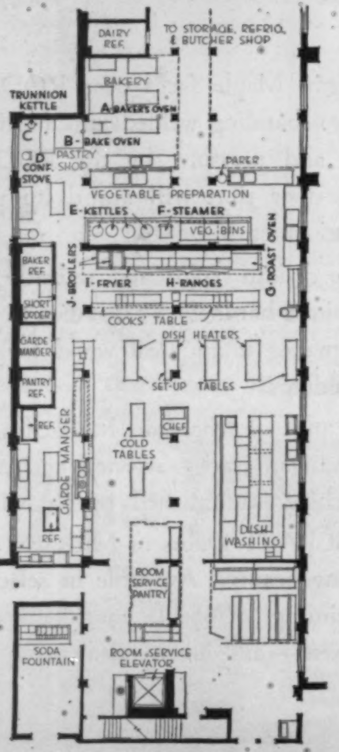
REMOVABLE SLAT BLIND

For easier cleaning of the *Walker Removable Slat Blind*, the cord runs through notches at the edge of the slat,

(*Continued on page 136*)

KITCHEN PLAN NO. 36: Thirty-sixth of a series of successful mass-feeding kitchen plans.

This kitchen at Montauk Manor, Montauk, Long Island, is designed for sumptuous dining room, night club and room service meals to be served fully a la carte.



KEEP FOR HANDY REFERENCE!

COOKING EQUIPMENT USED:

BAKE SHOP:
(a) 1 No. 982 BLODGETT GAS-FIRED OVEN
PASTRY SHOP:
(b) 1 No. 963 BLODGETT GAS-FIRED BLODGETT BAKE OVEN
(c) 1 Trunnion kettle
(d) 1 Gas-fired confectioner's stove
MAIN KITCHEN:
(e) 4 Stock kettles
(f) 1 Vegetable steamer
(g) 1 No. 953 BLODGETT GAS-FIRED ROAST OVEN
(h) 5 Gas-fired solid top ranges with two spreader plates
(i) 1 Gas-fired deep fat fryer
(j) 2 Gas-fired ceramic broilers

Designed by:
A. Mathesius, of the H. F. Rutley Co., Brooklyn, N. Y.

TECHNICAL DATA
IDEAS - ADVICE
INFORMATION
CONSULT YOUR
FOOD SERVICE
EQUIPMENT DEALER

THE NO. 982 BLODGETT GAS-FIRED BAKE OVEN in the bake shop of this installation provides 8-pan capacity with two heat controls; THE 963 BLODGETT BAKE OVEN in the pastry shop furnishes capacity for 36 10" pies or six bun pans, in three individually controlled sections. THE 953 BLODGETT ROASTING OVEN in the main kitchen bank has capacity for more than 600 lbs. of roasts in its three individually controlled sections. For details and specifications of BLODGETT OVENS consult your equipment house or write

The G. S. BLODGETT CO., Inc.
50 Lakeside Avenue Burlington, Vermont

Reprints of this new series will soon be available to architects on request

The Texas Method of Lighting Schoolrooms gives: A STARTLING INCREASE IN EDUCATIONAL GROWTH . . .

PLUS . . . A Significant Reduction in Classroom Visual Difficulties and Energy Problems!

Your School can do it, too!

BEFORE

AFTER

It is not difficult to get the remarkable results Texas has in its experimental program for using light in schools.* This consists of proper painting of walls and ceilings with Luminall—the light-reflective paint and proper fenestration and seating arrangements. Here is a challenge to school authorities to find the way for their community to give greatly improved well-being and an amazing increase in educational growth to their school children.

Send today for descriptive literature. Address National Chemical & Mfg. Co., 3610 S. May Street, Chicago 10, Ill.

** Developed in the Mexia Texas Public Schools under the direction of D. B. Harmon and reported in—Illuminating Engineering; Architectural Record, etc.*

LUMINALL

the light-reflective paint for interiors

(*Continued from page 134*)

instead of through the center, thus permitting the individual slats to be lifted out. The cord is next to the rear tape on one side of the blind, and next to the front tape on the opposite side, equalizing the lifting balance of the blind. In addition to the convenience of the removable slat, other advantages claimed are that the new arrangement permits complete closure of the blind, and that the slats themselves are much stronger by reason of not being pierced in the center. The blinds are made with wood, steel or aluminum slats. Rupert N. Hoye, 2323 South Michigan Ave., Chicago 16, Ill.

AIRPORT LANDING STEPS

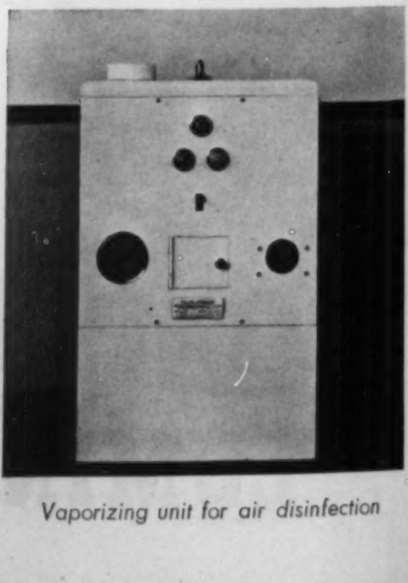
A portable passenger landing step unit has been designed so that it is adjustable for use with any airplane which has an entrance door sill within the range of 86 to 126 in. above the ground. Constructed of light-weight aluminum alloy, the unit is easily moved from ship to ship. It can be folded into an almost horizontal position when not in use. By adjusting the two telescoping sections, the height can be varied between eleven and sixteen steps. There are wider platform steps inserted in both the upper and lower sections for added convenience. Steps have a non-skid metal surface for safety. Positive lock brakes are provided on all truck wheels and casters. Lights installed in the lower sections of the handrails and step guards provide illumination during night operations. The Glenn L. Martin Co., Baltimore 3, Md.

FLOATING TRIANGLES

Neater drawings are produced by the *Instrumaster* "floating triangles," because integral embossed buttons elevate the lower surface from the drawing paper. Shifting between 45° and 30°–60° triangles is much reduced, as 45° triangles have 30°–60° triangular openings, and vice versa. The application of the elevator buttons accomplishes a triple purpose: to provide a ready fingerlift on all edges; to prevent ink runbacks between triangle and paper; to minimize smudging. They are available in even sizes from 4 in. to 12 in. Instrumaster Industries, Inc., Greenwich, Conn.

CORRECTION

The new air sterilizer shown on page 20 of the March issue of AR may be used in connection with an air conditioning system, but it is not in itself an air-conditioning unit, as was indicated. Disinfection of the air is accomplished in the *Glycolizer*, the unit mentioned, by means of triethylene glycol vapor mixed with a small volume of air in the unit, and released directly into the room. Other equipment produced by the same manufacturer for complete air conditioning employs triethylene glycol vapor for dehumidification as well as sterilizing. Rogers Diesel and Aircraft Corp., 1120 Leggett Ave., New York 59, N. Y.



Vaporizing unit for air disinfection

To Architects, Builders and Officials Interested in *Jail & Prison Equipment*

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CINCINNATI

Stewart has been designing and building jail and prison equipment since 1886, and numbers among its installations some of the largest penal institutions in this country. One of the most recent is the Criminal Courts Building and City Jail, Borough of Manhattan, New York, N. Y.

Stewart products include Grating and Plate Cells; Doors; Lock and Locking Devices; Bunks; Tables; Seats; Iron Stairways, and all modern jail equipment for a federal penitentiary or a village lockup.

Our engineers will be glad to give architects, builders and prison officials the benefit of many years' experience. Without cost or obligation we will submit layouts, estimates and complete information for entirely new construction, remodeling, or the rehabilitation of existing equipment.

You are cordially invited to avail yourself of the technical facilities offered by the Stewart jail and prison engineers. Address The Stewart Iron Works Co., Inc., 1365 Stewart Block, Cincinnati 1, Ohio.

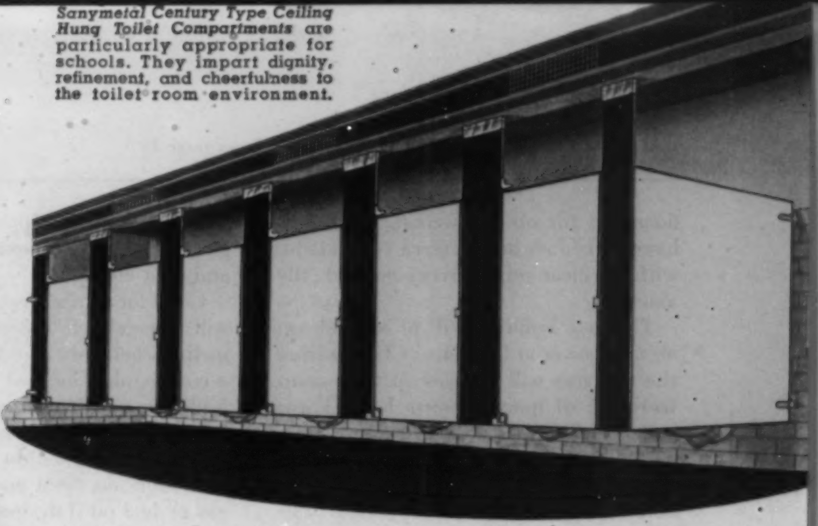
Stewart

Designers and Builders of Jail and Prison Equipment Since 1866

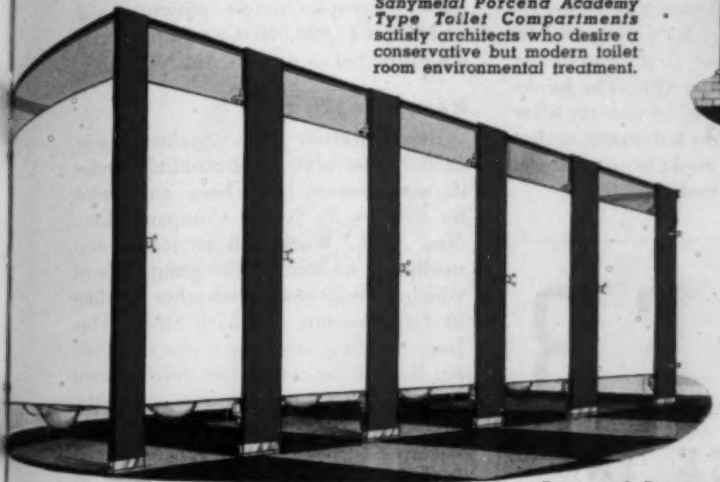
Sanymetal "PORCENA"

(Porcelain on Steel)

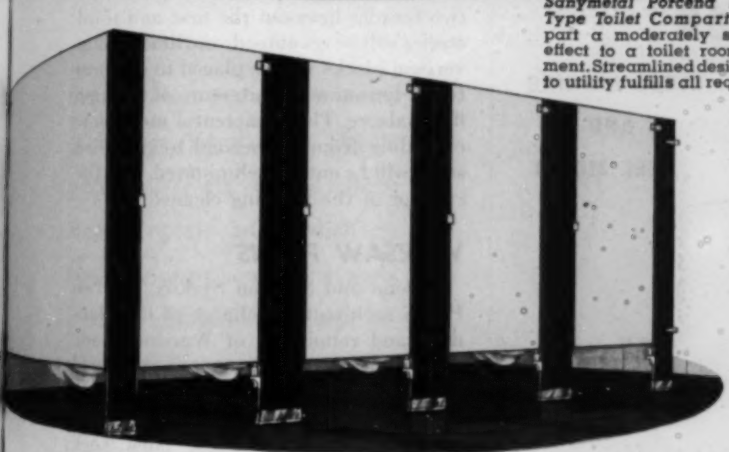
Toilet Compartments Elevate Toilet Room Environments Into Keeping with Other Environmental Treatments of a Building



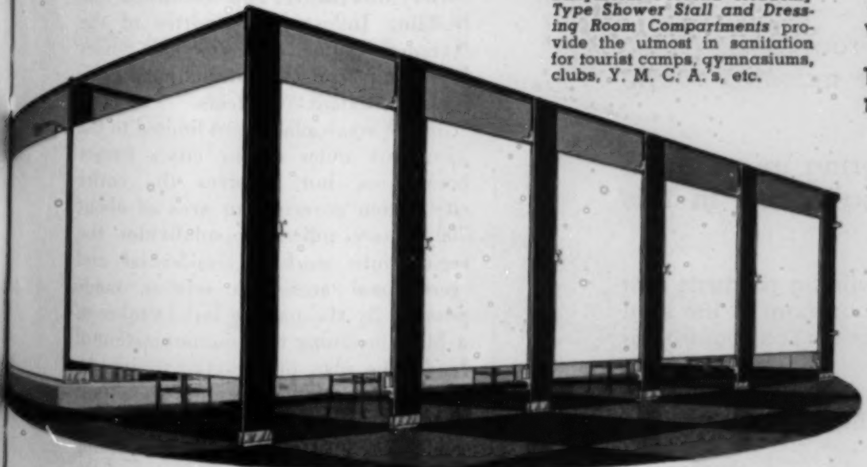
***Sanymetal Century Type Ceiling Hung Toilet Compartments** are particularly appropriate for schools. They impart dignity, refinement, and cheerfulness to the toilet room environment.*



***Sanymetal Porcena Academy Type Toilet Compartments** satisfy architects who desire a conservative but modern toilet room environmental treatment.*



***Sanymetal Porcena Normandie Type Toilet Compartments** impart a moderately streamlined effect to a toilet room environment. Streamlined design wedded to utility fulfills all requirements.*



***Sanymetal Porcena Academy Type Shower Stall and Dressing Room Compartments** provide the utmost in sanitation for tourist camps, gymnasiums, clubs, Y. M. C. A.'s, etc.*

● Toilet compartments usually dominate a toilet room, influencing the environment of a room which is important to everyone occupying the building. An installation of Sanymetal "Porcena" (Porcelain on Steel) Toilet Compartments develops an environment that is certain to continue to be appropriate over a longer period. These toilet compartments are fabricated of the ageless and fadeless material, porcelain on steel—a glass-hard, stainless material that always looks new, does not absorb odors, is moisture and rust proof and resists the corroding nature of ordinary acids. The glistening porcelain finish discourages defacement and can be wiped clean as easily as any glass-smooth surface, such as the surface of a kitchen range. Available in a wide variety of colors that provide lasting beauty and harmony. No other material offers such a high standard of sanitation.

Sanymetal "Porcena" Toilet Compartments embody the results of over 32 years of specialized skill and experience in making over 70,000 toilet compartment installations. Ask the Sanymetal Representative in your vicinity (see "Partitions" in your phone book for local representative) for further information about planning suitable toilet room environments for modern school, industrial, and institutional types of buildings. Refer to Sanymetal Catalog 19B-5 in Sweet's Architectural File for 1945, or write for file copy of Catalog 84.

THE SANYMETAL PRODUCTS COMPANY, INC.
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Sanymetal
toilet compartments
and toilet room environments
Catalog 84

***Sanymetal Catalog 84** illustrates several typical toilet room environments.*

*Sanymetal**

"PORCENA"

(Porcelain on Steel) TOILET COMPARTMENTS

possess the natural structural strength of steel, not one sheet, but two 16-gauge sheets securely bonded on opposite sides of dense insulating core, strengthened by porcelain enamel (four layers on each sheet) which provides a non-porous, flint-hard, glass-smooth surface that is positively impervious to odors, acids and moisture.

*Sanymetal**

**Trade Mark Reg. U. S. Pat. Off.*

TOILET COMPARTMENTS,
SHOWER STALLS AND
DRESSING ROOMS

BUILDING NOTES *(Continued from page 18)*

floor and tile on the second. Walls will have a reddish brown terra cotta dado, with a clear glaze ivory-colored tile above it.

The new building will provide steam air and power at the plant; CO^2 gas from the furnaces will be used in the manufacturing of quick process lead. Three boilers will be installed, each with a normal continuous output of 65,000 lb. of steam per hour, and a maximum four-hour capacity of 75,000 lb. per hour. The boilers will be equipped with traveling grate stokers, economizers, draft fans and dust collectors.

Coal for the operation of the plant will be carried to the power house by an inclined belt conveyor for distribution to a coal bunker located at the top of the building over the center aisle. The bunkers will feed the boilers by gravity after the coal is weighed on automatic scales. Provision has been made to use natural gas or fuel oil if desired later.

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Hospitals

The Veterans Administration hopes to complete construction of two new hospitals and 12 additions to existing structures by the end of the year.

The new hospitals, at Lebanon, Pa., and Tomah, Wis., will supply beds for 1,699 neuropsychiatric patients, will cost about $7,888,000. Completion dates are estimated as August and November.

Remodeling

Rehabilitation plans totaling nearly $250,000 for a score of buildings under its management have been announced by Charles F. Noyes Company, Inc., New York. Work will be started immediately on four of the group, one of which is the 25-story Heckscher Building at Fifth Avenue and 57th Street. This large building, covering a plot of 26,000 sq. ft., will be completely rehabilitated under the direction of Walker & Gillette, architects. A new ground floor front covering all stores on the Fifth Ave. and 57th St. frontages is on the docket: the two facades between the first and third stories will be revamped, and limestone in vertical blocks will be placed to conform to the limestone architecture of the nine floors above. The ornamental metal now extending from the second to the third story will be entirely eliminated, and the exterior of the building cleaned.

WARSAW PLANS

Helena and Szymon Syrkus, the two Polish architects in charge of the planning and rebuilding of Warsaw, made their first public report at a meeting held at the New School for Social Research, New York City, on April 20. The meeting was sponsored by the New York Chapter of the A.I.A., the American Society of Planners and Architects, the Building Industry Committee of the National Council of American-Soviet Friendship, and the International Congress of Modern Architects.

The Warsaw plan is not limited to the 55 square miles of the city's former boundaries, but involves the entire city region covering an area of about 700 square miles. It subdivides the region into working, residential and recreational areas — a scheme made possible by the passing last October of a bill concerning the communization of land. The plan of the community development is taken as the basic unit of the town structure. The size of this basic city unit is based on the walking distance of grown men, the size of the smaller groups of houses into which the basic unit is subdivided is determined "by the stride of small children or of the woman carrying her baby." The entire unit is closed to through motor traffic. Four hundred square feet per person are considered the requirement for the sound development of a unit of 10,000 people.

LATEST "KNOW HOW" ON SUMMER COOLING

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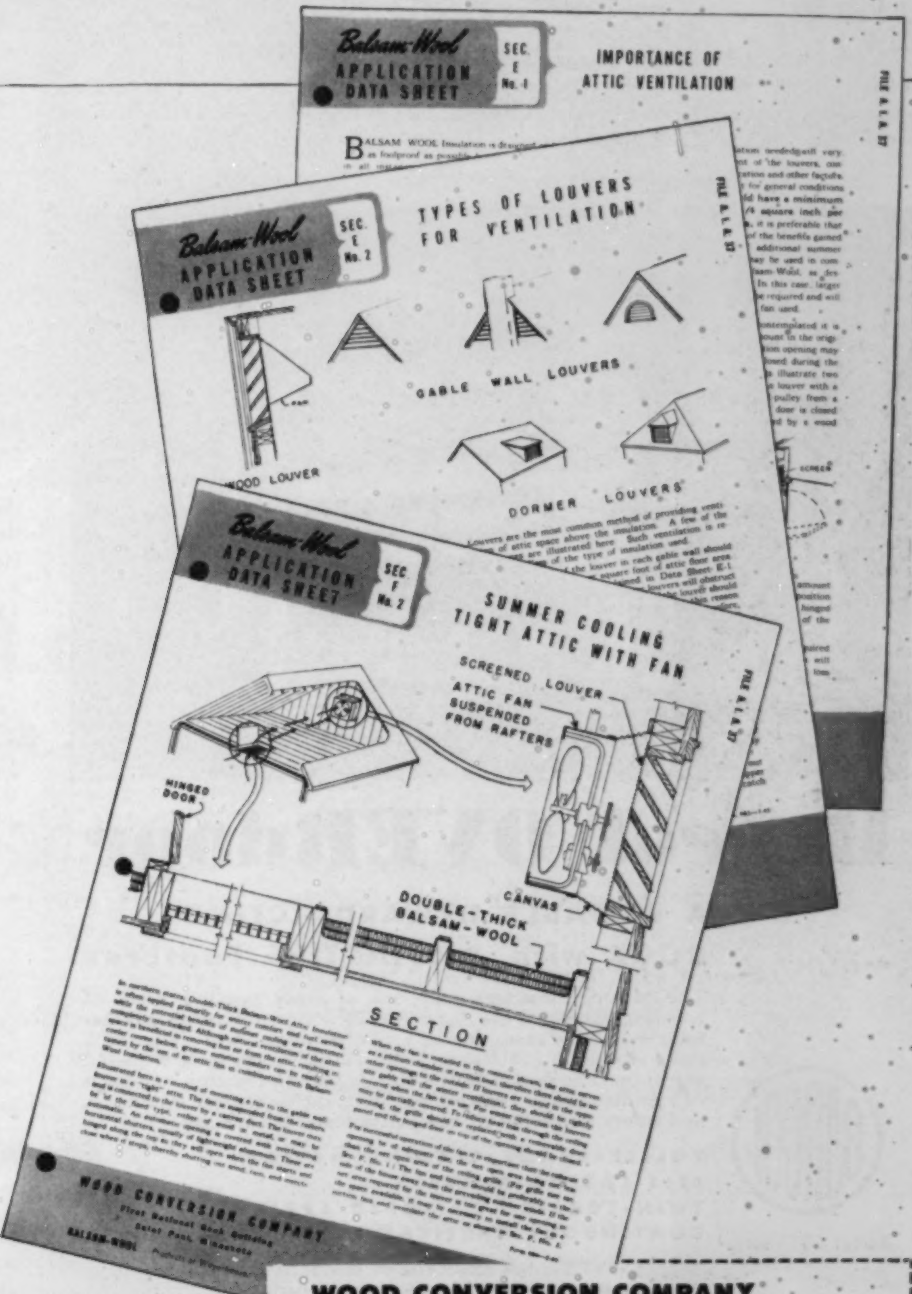
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DORMER LOUVERS
WOOD LOUVER
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APPLICATION DATA SHEET
SEC. F No. 2
SUMMER COOLING TIGHT ATTIC WITH FAN
SCREENED LOUVER
ATTIC FAN SUSPENDED FROM RAFTERS
HINGED DOOR
CANVAS
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PRIORITIES APPROVED

Applications for priorities involving 400,000 new dwelling units were approved by the FHA, acting for the CPA, between January 15 and April 26, 1946. The total consists of applications to construct 350,000 new homes, of which 55 per cent will be for sale at less than $7,500 or for rent below $60 a month. Another 50,000 units are covered by applications to remodel existing structures for the creation of additional units.

The FHA also approved over 9,000 applications for repair and alteration jobs between April 12 and April 26, many of them covering authorization to construct without priorities assistance, under the Veterans Emergency Housing Program.

AWARD DIVIDED

For the first time since its establishment in 1942, the John Wesley Hyatt Award was made a dual one when two men were honored for outstanding achievement in the plastics industry at the annual dinner of the Society of the Plastics Industry in April. A gold medal and half of the $1,000 award was presented to each of the winners: Virgil E. Meharg, superintendent of development, Bakelite Corp., and Paul D. Zottu, consulting electronic engineer of Newton, Mass. The winners were selected for their individual work in developing the use of electronic heating of thermosetting plastic materials. The award is sponsored by Hercules Powder Co.

COMPETITION

A competition to select a design and an architect for the proposed Minnesota State Veterans Service Building is now being conducted by the commission in charge of the project.

The building is to be erected on the grounds of the State Capitol in St. Paul. A total sum of $2 million has been appropriated by the State Legislature for the purpose. Roy Jones, F.A.I.A., head of the School of Architecture, University of Minnesota, is the professional adviser for the competition; Leon Arnal of Minneapolis, Harvey W. Corbett of New York, and John W. Root of Chicago, form the jury. The competition has been approved by the Competition Committee of the A.I.A.

First, second, third and fourth prizes, of $5,000, $2,500, $1,500, and $1,000 respectively, will be awarded to the four most meritorious designs submitted. Winner of the first prize will be commissioned to design and supervise the erection of the building.

Prospective competitors should apply to John W. McConneloug, Secretary, State Veterans Service Building Commission, 1745 Court House, St. Paul 2, Minn. Applicants should request a copy of the program, give full particulars of their individual or firm names and addresses, and state whether and in what states they are registered to practice architecture.

APPOINTMENTS

Dr. John D. Kraus, Harvard University research scientist and inventor of several wartime engineering devices, has been named associate professor of electrical engineering at Ohio State University, effective July 1. He will specialize in teaching and research in communications engineering.

Col. Harold Lee has been appointed governor of the Federal Home Loan Bank System. He has been associated with the FHLBA since 1934, has been its general counsel for the past seven years.

C. Stott Noble has been appointed Regional Housing Expediter for the Cleveland area, and a new regional office

(Continued on page 142)

E. W. SCHMELING & SONS
OFFICE

Barcol OVERdoor

A RELIABLE UPWARD-ACTING DOOR with DISTINCTIVE Features

The picture illustrates only one of many possible types of buildings in which the Barcol OVERdoor can be used successfully — in this case, that of a lumber dealer who required a large-size door (18 feet wide by 13 feet high) for a trucking entrance. The Barcol OVERdoor is built to exacting standards of manufacture to insure long life and trouble-free operation, and offers a number of distinctive features such as:

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Barcol OVERdoors
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Barcol OVERdoors are made in standard sizes for residence garages and in special large sizes to order for commercial, industrial, institutional, and similar buildings. Supplementary Barcol equipment includes Electric Door Operators for remote switch control of large doors and gates, and the Radio Control for opening and closing garage doors from a moving car by simply pushing a button. See your Barber-Colman representative for full details on any contemplated installation.

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The quarter-century plus record of Webster Traps cited above is not an isolated instance. In our files are many other records of ten . . . fifteen . . . twenty years and more . . . varying with service conditions, pressure, local water and quality of operating standards.

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AUTOMATIC
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(*Continued from page 140*)

has been opened in Cleveland. Mr. Noble, who was in private real estate business for 16 years, and was formerly a regional manager for the Home Owners Loan Corp., has been assistant administrator of the Farm Security Administration since 1944.

James L. Pease of Cincinnati, Ohio, has been appointed director of the Prefabrication Production Branch of the NHA. One of the founders, and a past president of the Prefabricated Home Manufacturers Institute, Mr. Pease is president of Pease Woodworking, Inc.

Ernest Pickering, head of the division of architecture in the School of Applied Arts, University of Cincinnati, since 1925, has been named dean of this unit, renamed the College of Applied Arts.

Rear Admiral Kirby Smith, USNR (Civil Engineering Corps), has been appointed General Deputy Expediter for the Veterans Emergency Housing Program. One of the Navy's top-ranking construction men during both World Wars, Admiral Smith was largely responsible for developing and supervising a $4,500,000,000 building program for the Navy Department in the United States, Hawaii, the Canal zone, etc. He will be general deputy for Wilson Wyatt, in charge of all operations of the housing program, but will concentrate in the coming months on problems of supply and production.

Prof. James G. Van Derpool, head of the department of art at the University of Illinois since 1940 and associated with the departments of architecture and art at Illinois since 1932, has been appointed librarian of the Avery Library and a member of the faculties of the School of Architecture and School of Library Science at Columbia University, effective next September 1.

ELECTIONS

Chester S. Allen has been elected president of Lockwood Greene Engineers, Inc., succeeding the late Albert L. Scott. He has been with the company since 1910. Another newly elected Lockwood officer is Howard E. Cousins, named a vice president.

Clarence W. Farrier has resigned as director of the Technical Division of the NHA to become assistant to the president of Gunnison Homes, Inc.

Dawson Winn, vice-president of Green Lumber Co., Laurel, Miss., has been elected president of Prefabricated Home Manufacturers' Institute. The other newly elected Institute officers are: vice-president, Austin Drewry, secretary of Gunnison Homes, Inc.; secretary-treasurer, John Pease, Pease Woodwork Co.

OFFICE NOTES

Offices Opened, Reopened

C. A. Balch and Wm. Glenn Balch, Architects, and L. L. Bryan announce the opening of their office for the general practice of architecture at 1725 Silver Lake Blvd., Los Angeles 26, Calif.

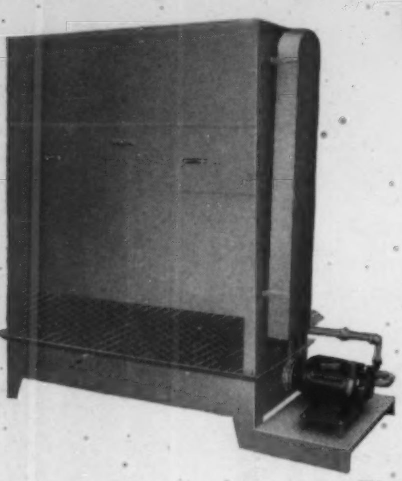
Stanley F. Chamberlain, Industrial Designer, has opened a completely equipped model-making shop at 317 E. 91st St., with offices at 654 Madison Ave., New York City.

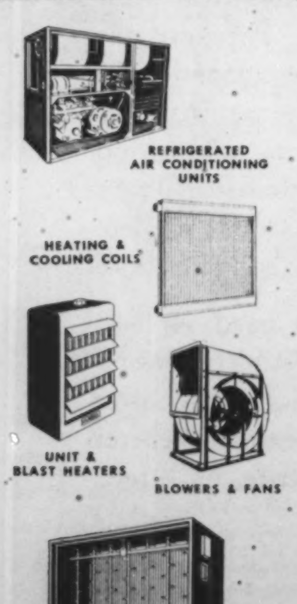
Robert Allan Class, A.I.A., has announced the establishment of professional offices for the general practice of architecture in the Architects Bldg., 17th St. at Sansom, Philadelphia 3, Pa.

Leonard B. Conley, Residential and Commercial Designer, has reopened his offices at 906 Neil P. Anderson Bldg., Fort Worth, Texas, following his release from the Army.

Daniel, Mann and Johnson, Architects of No. 15, Motta Bldg., Santa Maria,

(*Continued on page 144*)





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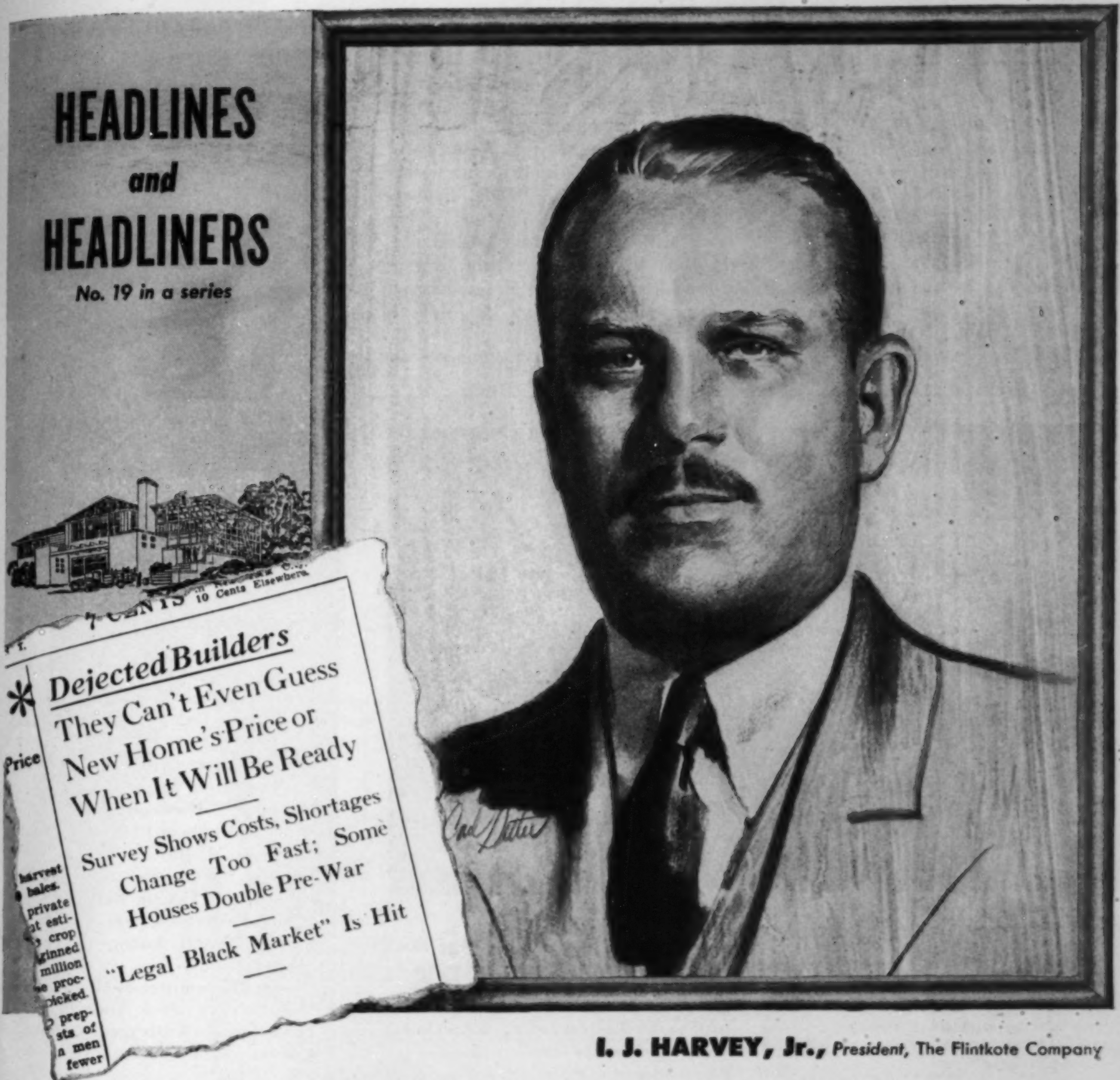

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Calif., have opened an additional office at 672 S. Lafayet Park Pl., Los Angeles.

Frank Grad & Sons, Architects and Engineers, of 48 Commerce St., Newark 2, N. J., have opened a branch office at 1633 Connecticut Ave., N.W., Washington, D. C.

Roy A. Kazebier, A.I.A., has established his office for the general practice of architecture in Suite 15, 111 West B. St., Ontario, Calif.

Robert W. Kennedy and Theodore Jordan announce the opening of an office for the practice of architecture at 687 Boylston St., Boston, Mass.

E. J. Peterson, Architect, has opened offices in the Sherwood Bldg., Spokane 8, Wash., following four and a half years with the U.S. Army Engineers.

Owen F. Smith, Architect, has returned from the Navy and has opened an office at 2730 Anderson Dr., Raleigh, N. C.

Edward D. Stone has announced the reopening of his New York architectural office at 50 East 64th St., New York 21, N. Y. Associated with him are Stanley C. Reese, Alexander Knowlton, J. Graham Stewart and Karl J. Holzinger, Jr.

Allan Wallsworth, Architect, has resumed the practice of architecture with offices at 2846 N. Prospect Ave., Milwaukee 11, Wis.

Jarrett C. White, A.I.A., has reopened his office at 1308 18th St., N.W., Washington, D. C., following three years as consultant to the Surgeon General, U.S. Army.

Harry Hayden Whiteley, Architect, has returned to his practice with offices at 2400 Fifth Ave., San Diego 1, Calif.

Paul P. Wiant, A.I.A., A.S.C.E., for many years prior to 1944 director of the Union Architectural Service, Foochow, China, is now architect and engineer for the Methodist Church in China, with offices at 169 Yuen Ming Yuen Road, Shanghai.

New Addresses

The following new addresses have been announced:

Victor D. Abel, Architect, Architects Bldg., 117 S. 17th St., Philadelphia 3, Pa.

Samuel Glaser, Architect, 105 Newbury St., Boston, Mass.

Holsman & Holsman and Klekamp, Architects, Dunham Bldg., 450 E. Ohio St., Chicago 11, Ill.

Johnson, Wallwork & Dukehart, Architects, 802 Dekum Bldg., 519 S.W. 3rd Ave., Portland 4, Ore.

Isadore Naftali, Architect, 312 High St., Newark, N. J.

National Committee on Housing, Inc., 1 Madison Ave., New York 10, N. Y.

Pennell and Wiltberger, Consulting Engineers, 1524 Chestnut St., Philadelphia 2, Pa.

Firm Changes

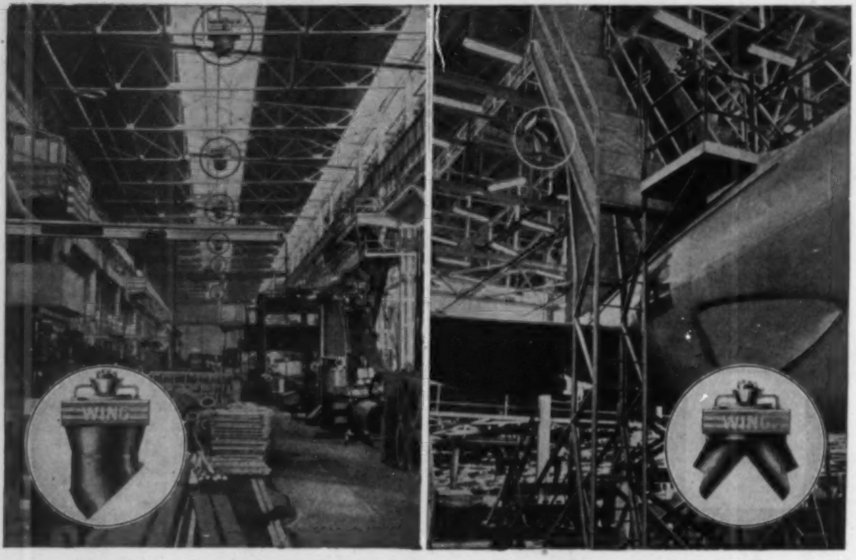
Announcement has been made of the merger of the architectural offices of George Harwell Bond and Cooper & Cooper and the formation of the firm of Cooper, Bond & Cooper, Inc., Architects and Engineers, with temporary offices at 827–830 Forsyth Bldg., Atlanta, Ga.

William Wayne Caudill and John Miles Rowlett, both recently returned from service in the Navy, have established an architectural partnership under the firm name of Caudill and Rowlett, Architects, with offices at 1401½ Lavaca St., Austin, Texas.

L. C. Cavitt, Jr., and Clifford J. Lane have established the firm of Cavitt and Lane, Architects and Engineers. Address, 4801 Lemmon Ave., Dallas 9, Texas.

Theodore W. Dominick and William

(Continued on page 146)



Two Problems in Plant Heating Solved by WING Revolving HEATERS

Two striking instances of the unique advantages of Wing Revolving Heaters are presented in the photographs above.

At the left is one of the shops of a large shipbuilding concern, where a high ceiling and a crowded shop area of 802 ft. x 156 ft. presented a heating problem that could not be overcome by ordinary heating systems. The solution was Wing Revolving Heaters, located 61 feet above the shop floor, projecting heated air down to the working level through slowly revolving outlets, circulating the heat thoroughly to every part of this huge shop in a constant, even temperature.

At the upper right is part of the assembly shop of one of the world's largest builders of cargo planes. This modern plant is heated by Wing Revolving Heaters. No other type of heater could so thoroughly and evenly heat a plant of this kind, where the massive planes form imposing obstacles to the projection of heated air from fixed discharge outlets. But with the slowly moving streams of warm air from the revolving discharge outlets of the Wing heaters, circulating around and under the huge plane bodies, wings, rudders, stabilizers, etc., the plant is kept at a uniform, comfortable temperature.

Operating officials in both plants find that the sensation of warm, live, invigorating comfort enjoyed by the workers is stimulating to production. And in summer, with the steam turned off and the fans on, a cooling effect is obtained that is likewise conducive to production.

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BUT NOT FOR LONG

He consulted with the architect and engineer . . . together they called in Ceco . . . and the job went ahead on schedule

The job was a big one—the kind contractors like. It looked like smooth sailing to Casey until lack of materials suddenly stopped the job. But not Casey! With the architect, the engineer and Ceco, he made changes to use available Ceco products such as Concrete Reinforcing Bars, Meyer Steelforms, Welded Wire Fabric, Light Fabricated Trusses and Open Web Steel Joists, all of which gave greater advantages—in space and cost—in manpower and installation. The gist of it all is that Casey completed his contract on time, within the original cost, and to the satisfaction of the architect and owner.

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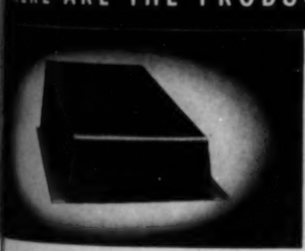
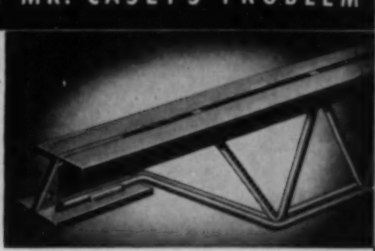
Ceco engineers do more than design fine construction products. All their wealth of technical engineering knowledge is constantly available to you, as well as their construction know-how gained by years of experience on the job in the field. In 23 offices strategically located from coast to coast, they stand ready to help solve your problems without delay, with perfect technical skill. Ceco Construction Products, whatever they are, are engineered so as to make for ease of installation and correct construction practice. So call on Ceco for engineering and construction skill, for the finest in construction products.

HERE ARE THE PRODUCTS THAT HELPED SOLVE MR. CASEY'S PROBLEM

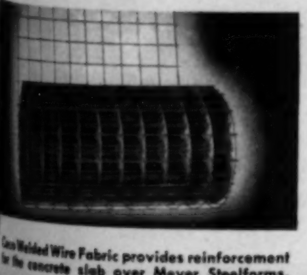


Meyer Steelforms mean less concrete is required, making for economy in construction.

Ceco Reinforcing Bars provide positive bond to aid adhesion of concrete to the steel.



Open Web Steel Joists provide fire-resistive construction, concealing sanitary, lighting and heating systems.



Ceco Welded Wire Fabric provides reinforcement for the concrete slab over Meyer Steelforms.

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They're a sound investment in long-term satisfaction . . . they resist corrosion and rust indefinitely . . . they are easily installed, maintained, replaced . . . they deliver high efficiency and resultant low operating cost.

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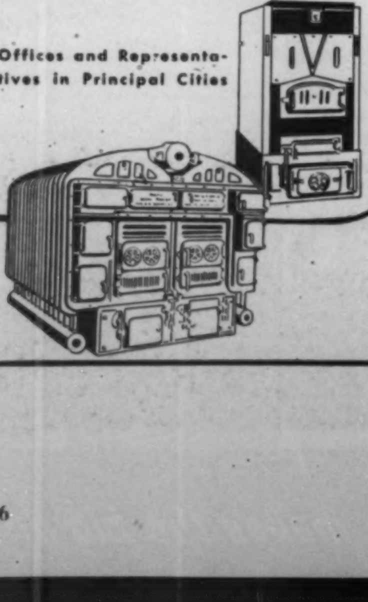

THE RECORD REPORTS

(Continued from page 144)

H. Van Benschoten have formed a partnership under the firm name of Dominick and Van Benschoten, Architects, with offices at 1122 19th St., N.W., Washington 6, D. C.

Announcement has been made of the opening of the offices of Ford and Hobson, Architect and Engineer, Cor. Govt. and Broad Sts., Office No. 9, Mobile 18, Ala.

Grunsfeld, Yerkes & Koenig, Architects, have announced the addition to their partnership of Samuel Arthur Lichtmann, A.I.A., and the change of the firm name to Grunsfeld, Yerkes, Lichtmann & Koenig, Architects & Engineers. Address, 520 N. Michigan Ave., Chicago 11, Ill.

The Hingham Construction & Supply Co., Box 53, Hingham, Mass., has announced resumption of its activities following the return of its key men from the Armed Services.

McKim, Mead & White, 101 Park Ave., New York, have announced that Edward James Mathews is now affiliated with their organization as associate.

Kenneth H. Ripnen Co., Inc., Management Counsellors in Space Administration, announces the return of its president, Kenneth H. Ripnen, Major, A.U.S., who during the war was assigned to the Army Service Forces as Space Officer in the Office of the Army Headquarters Commandant, War Department. Mr. Ripnen, a member of the A.I.A., will also continue his private practice in commercial and industrial architecture.

George H. Schaffer has been named president of the newly formed Spence-Rigolo, Inc., an industrial and architectural firm with offices at 677 Fifth Ave., New York City. The firm is the outgrowth of the partnership of Edmond J. Spence, Industrial Designer and vice president of the new firm, and Arthur Rigolo, Architect and Industrial Designer, secretary-treasurer.

Sundberg & Ferar, Industrial Designers, have taken new and larger quarters in the Guardian Bldg., Detroit, Mich. The firm's two model shops in Detroit will continue operating in separate establishments.

P. M. Torraca, former associate professor of architectural engineering at the Virginia Polytechnic Institute, has been appointed a member of the Home Bureau of the General Electric Co., Bridgeport, Conn.

Frank Vitullo, formerly publications and exhibitions designer at the Museum of Modern Art, New York, has joined Bertell Inc., 40 E. 49th St., New York 17, design and development organization, as art director.

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ORNAMENTAL METAL

Famous for Quality
Since 1882

THE State Capitol of Louisiana (shown above) is a magnificent example of NEWMAN QUALITY AND NEWMAN SKILL . . . but from coast to coast are other shining and illustrious installations which portray this NEWMAN touch. Architects' dreams are crafted into handsome ornamental bronze, aluminum, nickel and stainless steel.

BANK FIXTURES • GATES • GRILLES
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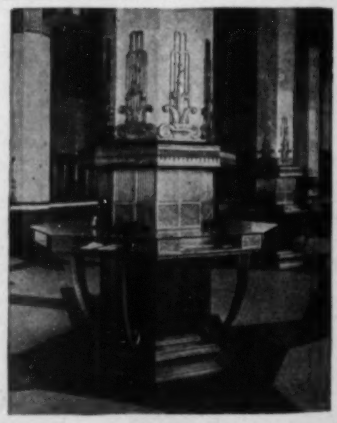
Hollow, cast or wrought work "equal to the finest"

HAND-CHASED TABLETS

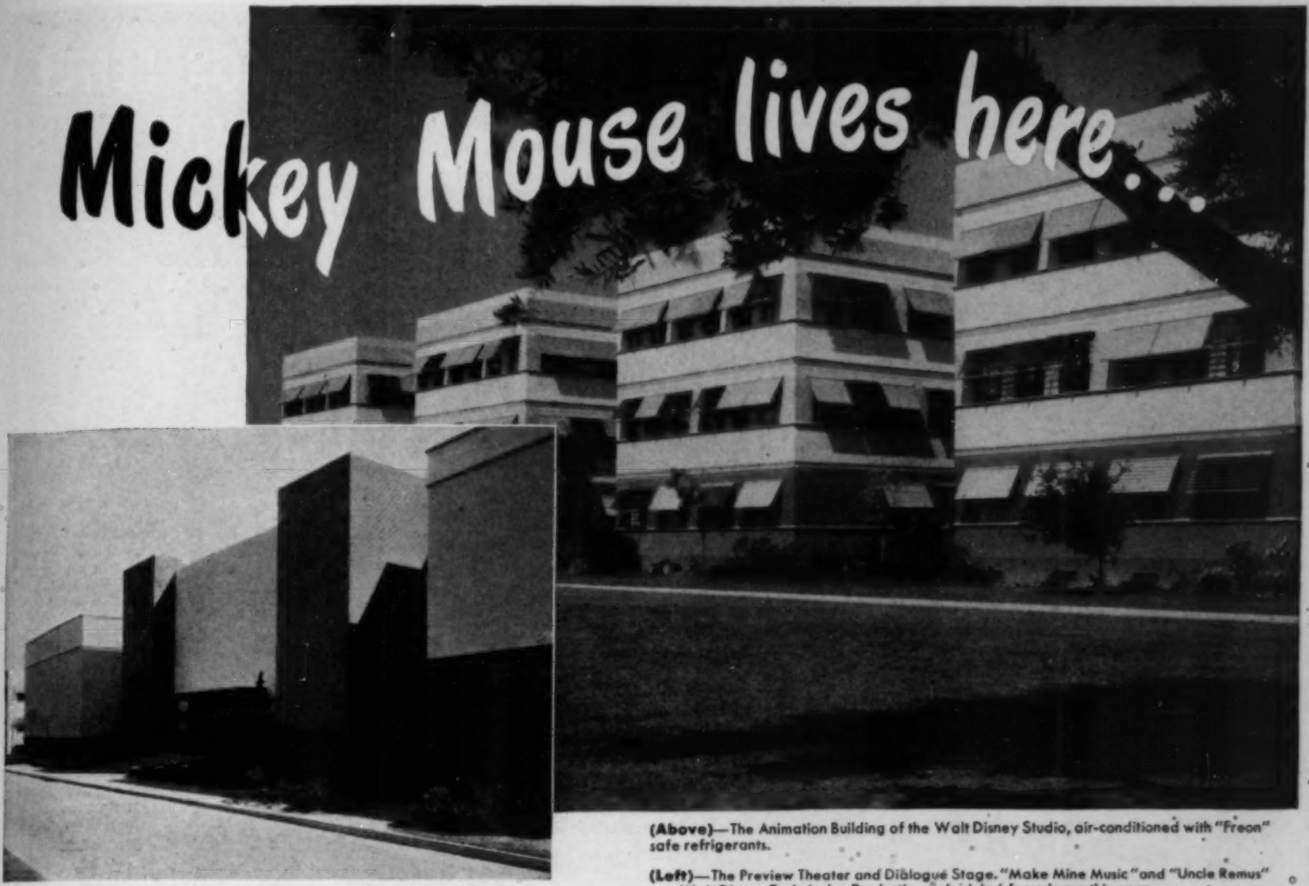
Newman artistry reaches new peaks of perfection in interpreting the ideas and ideals of foremost designers who choose this as the medium of lasting expression . . . in "the metal of countless tomorrows."

WRITE FOR COMPLETE FILE DATA FREE
Estimates and construction information sent promptly, without obligation.



NEWMAN BROTHERS, Inc.
"64 Years Young"
708 W. 4TH *Street*
CINCINNATI 3, OHIO

Mickey Mouse lives here...



(Above)—The Animation Building of the Walt Disney Studio, air-conditioned with "Freon" safe refrigerants.

(Left)—The Preview Theater and Dialogue Stage. "Make Mine Music" and "Uncle Remus" are Walt Disney Technicolor Productions scheduled for release this year.

HOME OF WALT DISNEY PRODUCTIONS
safely cooled with "FREON-12"

IN DESIGNING the Walt Disney Studios in Burbank, California, architects were vitally concerned with the need for safety in controlling temperature and humidity throughout the various buildings.

In the building where animated pictures of the famous Disney characters are made, inflammable motion picture film is used. To reduce the fire hazard . . . it was good judgment and a logical choice to select air conditioning equipment designed to utilize nonflammable "Freon." "Freon" safe refrigerants are also non-toxic, non-explosive, odorless and stainless.

The air conditioning equipment, installed in 1940, consists of two banks each of six General Electric 8-cylinder V-type reciprocating compressors with a total of 600 h.p. Their operation is 100% automatic, governed by the temperature of a circulatory water loop which provides a positive control at all times of comfort-cooling and humidity.

Humidity Control Essential

Average temperature within the studio buildings is maintained between 72°F. and 75°F. In the Inking and Painting buildings, regulated humidity is essential to prevent paint from becoming tacky on the celluloids. Films must also be safely kept under controlled climatic conditions both before and after processing.

"Freon" safe refrigerants have become the first choice of prominent architects and engineers everywhere. They recognize the importance not only of the safety of these refrigerants, but also of their purity and almost complete absence of moisture . . . factors which contribute to the dependable operation and longer life of the equipment. Complete data for your files upon request.

Kinetic Chemicals, Inc., Tenth and Market Sts., Wilmington 98, Delaware.

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FREON IS KINETIC'S REGISTERED TRADE-MARK FOR ITS FLUORINE REFRIGERANTS AND PROPELLENTS

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the ABC and the XYZ
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MODERNIZATION

Now you can plan with confidence, build with certainty . . . know your project will come within your budget . . . that your investment will not be short-circuited by premature style senility.

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(*Continued from page 126*)

high-tensile, low-alloy steel. Dimensions, load and other design data tables are furnished for structural members made of this material. 16 pp., illus. Jones & Laughlin Steel Corp., Pittsburgh 30, Pa.*

VALVES

Walworth Today, Vol. 6, No. 5. Booklet describes manufacture of malleable iron unions and union fittings. The outstanding features of a new line of iron body gate valves are presented. Sectional drawings show details of their construction. 14 pp., illus. Walworth Co., 60 East 42nd St., New York 17, N. Y.

LITERATURE REQUESTED

The following individuals and organizations request manufacturers' literature:

Bank of the Manhattan Co., Att. Mr. W. G. Pedersen, 40 Wall St., New York.

Building & Manufacturing, Publication, Ryan House, Eagle St., Brisbane, Australia.

Cavitt & Lane, Architects and Engineers, 4801 Lemmon Ave., Dallas 9, Tex.

Caudill & Rowlett, Architects, 1401½ Lavaca St., Austin, Tex.

C. C. Cheng, Architect, New China Syndicate, Ltd., Chung Cheng Rd., Shanghai, China.

Childers & Kohli, Engineers, Longanbach Block, Fremont, Ohio.

Daniel, Mann & Johnson, Architects, 672 South Lafayet Park Place, Los Angeles, Calif.

DelVisco-Reisinger Co., Engineers and Builders, 106 Glenridge Ave., Glen Ridge, N. J.

Frank Grad & Sons, Architects and Engineers, 48 Commerce St., Newark 2, N. J.

Roy A. Kazebier, Architect, 15 Euclid Bldg., 111 West B St., Ontario, Calif.

Aquiles Landoff, Architect, Casilla 119, Viana 35, Vina Del Mar, Chile.

Owen F. Smith, Architect, 2730 Anderson Drive, Raleigh, N. C.

Savo M. Stoshitch, Architect, 10328 Eastborne Ave., Los Angeles 24, Calif.

Vann & Lyell, Architects, 2260 N.W. North River Drive, Miami, Fla.

Allan Wallsworth, Architect, 2846 North Prospect Ave., Milwaukee 11, Wis.

H. H. Whiteley, Architect, 2400 Fifth Ave., San Diego 1, Calif.

Paul P. Wiant, Architect and Engineer, Methodist Church in China, 169 Yuen Ming Yuen Road, Shanghai, China.

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First Chain Link Fence Still in Service After 39 Years

Testifying to the ruggedness of Anchor Fence is the protection this installation has given at the Ampere, N. J., plant of the Crocker-Wheeler Electric Manufacturing Company since 1907. This fence is held erect and in line by our exclusive deep-driven anchors. These anchors clamp to the posts . . . are driven deep into the sub-soil . . . form a 3-point "tree root" anchorage. Yet, they permit easy relocation when necessary.

Three other exclusive features add to Anchor Fence's performance. *Square Frame Gates* . . . amazingly free from sagging and warping. *U-Bar Line Posts* . . . self-draining, rust-free and rigid. *Square Terminal Posts* . . . which improve strength, durability and appearance. Whether you're specifying fence for industrial or residential installations, these four big advantages are your extra assurance of satisfied clients.

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Let us send you our Specification Manuals on Anchor Chain Link and Anchor-Weld Iron Fences. Contain installation photographs and sectional drawings . . . describe various heights, weights, structural features and applications . . . include helpful sample specifications of many types of fencing jobs. Address: Anchor Post Products, Inc., 6600 Eastern Ave., Baltimore 24, Maryland.

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If you have school building or modernizing plans under consideration, let us discuss with you the place in those plans for The Nesbitt Syncretizer or the complete Nesbitt Package.

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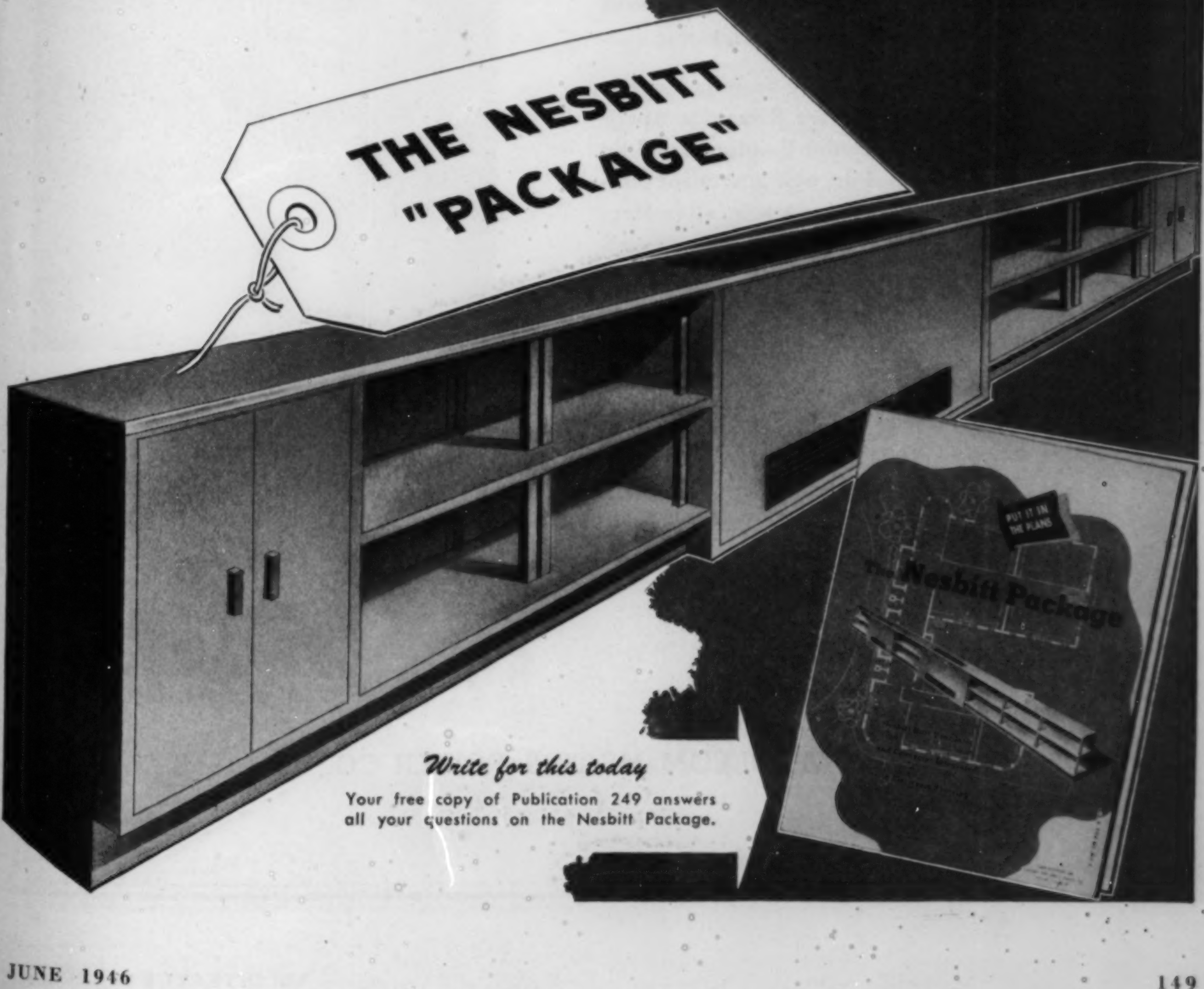

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Your free copy of Publication 249 answers all your questions on the Nesbitt Package.

Wherever Cleanliness, Economy,

THIS ARCHITECT CHOOSES

WILLIAM I. HOHAUSER is well-known as one of America's leading architects. He has done such theater jobs as the Community Theater, Hamilton, N. J.; Beacon Theater, Beacon, N. Y.; the Lane, Symphony and Tribune Theaters in Manhattan; the Clinton Theater in Brooklyn; and the Avon Theater in Stamford, Conn.

He is now working on the renovation of the former Anderson Galleries at 59th Street and Park Avenue in New York into one of the country's finest movie houses.

Among other outstanding projects Mr. Hohauser has designed are Riveredge Apartments; 307 Fifth Avenue Building; Franklin Tower Hotel; and the new apartment projects for Fifth Avenue & 68th St., all in Manhattan. Also Kensington Gardens in Buffalo; Manchester Gardens in Manchester, Conn.; and Joseph P. Bradley Court in Newark.

He is one of the architects of such public housing projects as the Red Hook, Fort Greene and Wallabout Houses in Brooklyn.

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PETROLEUM HEAT & POWER CO., Stamford, Connecticut

Convenience, Quiet Come First

PETRO OIL BURNING EQUIPMENT!

In a theater or in a home, apartment or commercial building, today's standards of better living call for a heating system that contributes to the occupants' comfort, convenience and health. Freedom from drudgery and costly maintenance must go hand in hand with fine, economical heating performance.

How do Petro Oil Burning Systems measure up to these exacting requirements? An ever-growing number of architects and engineers can give you the answer. For example, here is the way Mr. William I. Hohauser puts it:

"We believe the theater of the future will be distinguished by simple design and will be more functional than the pre-war theater. Special attention will be devoted to lighting, heating, air-conditioning, visual conditions, and pleasant environment for the patrons. Motion picture theaters promise to lead the way in the upward trend, and community theaters will play a larger role in American life with their presentations integrating educational along with recreational facilities.

"In my opinion oil heating maintains its superiority for theaters, where cleanliness, convenience, economy and quiet surroundings are essential. Where Petro systems are in use, I know from experience that fuel costs are very favorable in comparison with coal, and labor costs have resulted in a saving of at least 15% and from there up.

"The wide range of Petro Oil Burning Systems can be considered a common denominator for any type of building. They are sturdy in construction and extremely efficient in operation."

In fact, architects who know all agree the best reason for installing Petro is that in the long run anything else costs considerably more.

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No. 5 or No. 6 fuel oil, manual, semi-automatic or automatic operation, 8 sizes to 450 bhp. "Thermal Viscosity" preheating.

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No. 3 or lighter oils, "conversion" and combination-unit types, 7 sizes. Patented "Tubular Atomization."

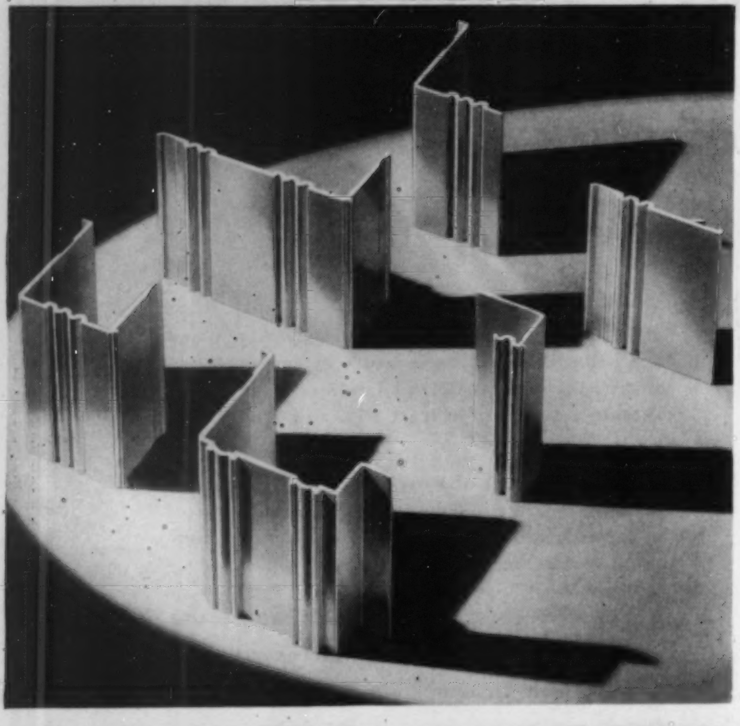
FULL DATA

on Petro Industrial Burners are in catalog files of Sweet's and Domestic Engineering. Details on Petro Domestic burners available in separate catalog. Copy of either sent gladly on request.

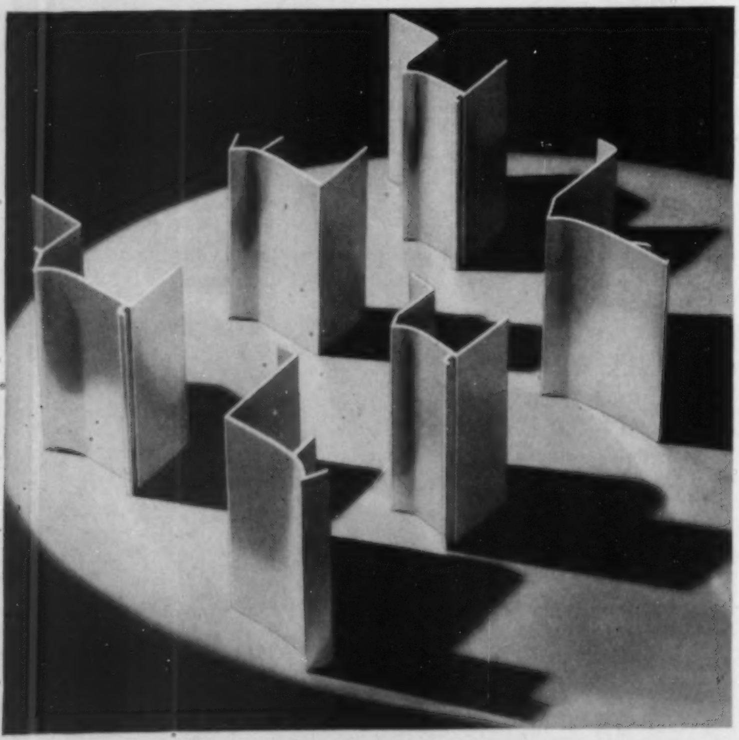
CUTS STEAM COSTS

Makers of Good Oil Burning Equipment Since 1903

There are *two* lines of Pittco Metal — each distinctively styled



PITTCO DE LUXE Since its introduction several years ago, the Pittco De Luxe line of store front metal has won a hearty endorsement from architects. Careful planning of the line as a whole, all at one time, resulted in unusual unity of design—a harmonious relationship between each Pittco De Luxe unit and all the other members in the line. And the extruded method of manufacture assures rugged strength, clean, sharp profiles, lasting color and perfect finish. This unrivalled combination of characteristics accounts for the continued popularity of Pittco De Luxe. It is first choice with architects whose clients demand sales-winning store fronts which reflect high quality.



PITTCO PREMIER Recently, Pittco Premier was introduced to satisfy the need for a lightweight, moderately priced line of store front metal. The same careful planning and harmonious styling which have made Pittco De Luxe so popular are evident in the Premier line. Pittco Premier also was designed as a unit . . . each piece styled to complement and heighten the beauty of the other members with which it is used. Pittco Premier can be set easily and quickly from the outside, effecting a substantial savings in setting time. And the self-adjusting clip always maintains a firm grip on the glass, no matter what its thickness. These practical advantages plus the high degree of architectural beauty in the Premier line promise success comparable to that already attained by Pittco De Luxe.

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PITTSBURGH PLATE GLASS COMPANY

"PITTSBURGH" stands for Quality Glass and Paint

Beautiful

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★ For magnificent institutional and monumental structures, smaller buildings, and homes . . . authentic Indiana Limestone remains the most frequently specified stone of architects and builders throughout the United States and Canada.

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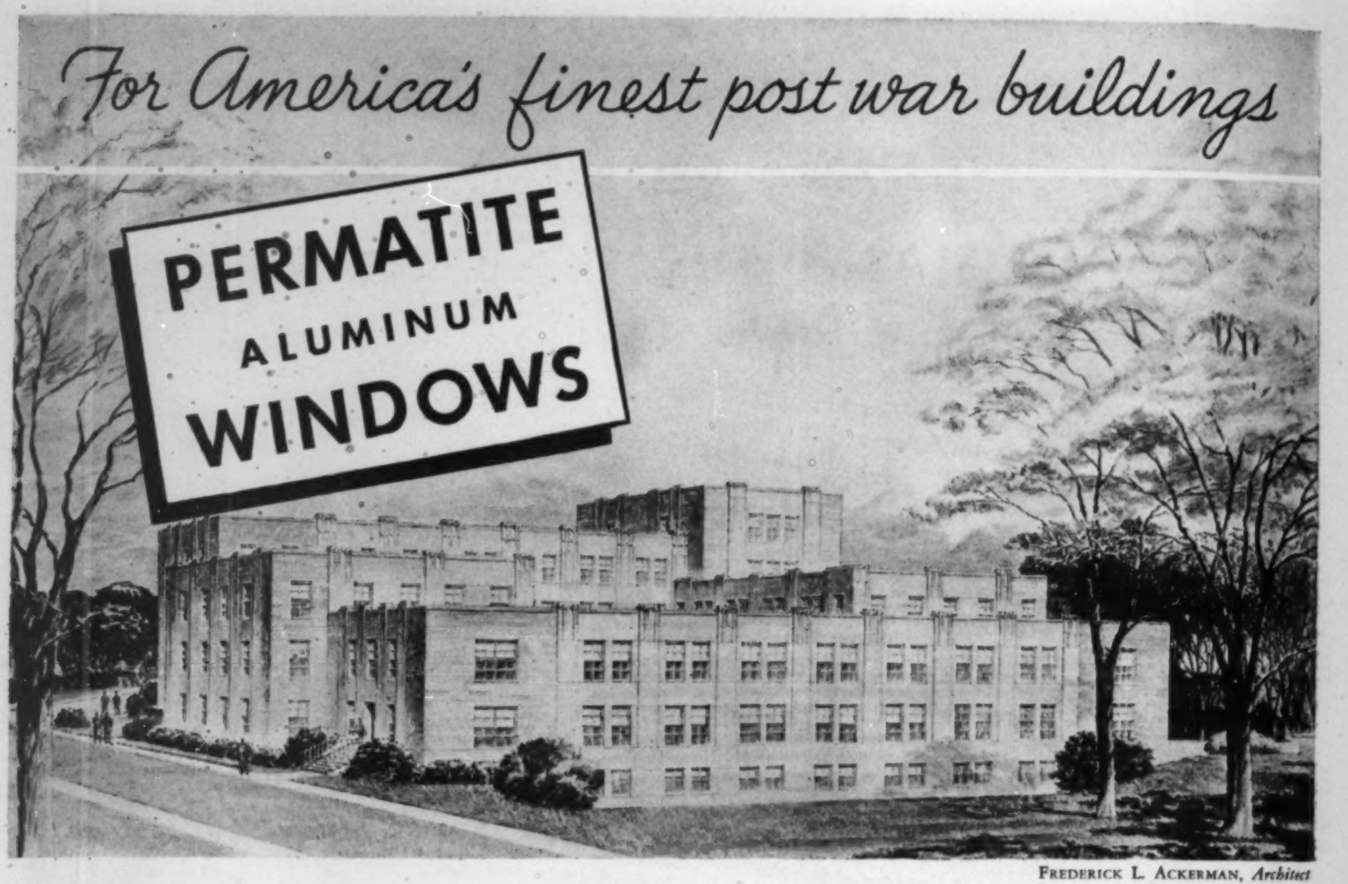
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WINDOWS

Frederick L. Ackerman, *Architect*
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Selected for the new ADMINISTRATION BUILDING at CORNELL UNIVERSITY

Before the war PERMATITE windows, made in either aluminum or bronze, were the choice of many leading architects. They were selected for use in schools, hospitals, apartments, public and commercial buildings.

Today, the preference for these fine quality windows is even greater than ever before. Architects, contractors and owners alike are demanding them for their finest post-war jobs in every field.

Selected for their beauty, ease of operation, freedom from periodic painting and other maintenance expense, PERMATITE aluminum windows are being used in the new administration building at Cornell University, Ithaca, New York.

For complete information, full size details, etc., on PERMATITE windows and other General Bronze building products, consult Sweet's or write for catalogs.

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Architectural Metal Work · Windows · Revolving Doors

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ENTERPRISE OIL BURNERS

They wanted to make The Esquire "the dream theater of Chicago" . . . and among the equipment specified were two ENTERPRISE Oil Burners. After eight years of operation, these Burners are still giving "the maximum in efficiency with minimum maintenance", say the theater's managers. (Economy note: The Esquire's ENTERPRISE Burners burn Bunker C oil automatically.) *ENTERPRISE Oil Burners are available in Manual, Semi-Automatic and Full-Automatic in combination with modulating fire control or special combinations for your specific requirements.* Combustion Equipment Division. ENTERPRISE ENGINE & FOUNDRY COMPANY, San Francisco 10. Distributors in principal cities.

Our 1886 60th Year 1946

ESQUIRE
THE ESQUIRE HOUR
AND
"BLACKOUT"
ESQUIRE

The Esquire Theater in Chicago. Inset, ENTERPRISE Oil Burners installed by Enterprise Heat and Power Co., 1401 West North Avenue, Chicago 22.

THE TRUTH ABOUT

UNTIL now, you've heard about Aquella from everybody but us.

First...there was Kurt Steel's absorbing article ("Dry Cellars") in the December 15, 1945 issue of Forbes Magazine.

Second...there was the condensation of this same article which appeared under the caption "Water Stay Away from My Wall" in the January issue of the Reader's Digest.

Third...there was a flood of anonymous letters containing garbled references to a Federal Trade Commission complaint, as well as a copy of a letter dated December 29th, 1945, which purported to have come from the Director of the United States Bureau of Standards.

Why you've not heard from us until now...

In the first place, we were far too busy getting out production to meet the nationwide demand for Aquella. Thousands wanted to be Aquella distributors. Thousands wanted to be Aquella dealers and contractors. And many, many thousands more wanted to buy Aquella for homes, institutions, and factories. Aquella had captured the public's imagination overnight.

Furthermore, at first we thought that this anonymous attack was just the work of some small, misguided competitor. Then, when the vast extent of the campaign became apparent, we conducted an investigation into the source and motives behind the attack.

The complete details and documentary evidence are to be found in our brochure "The Truth About Aquella."

The Bureau of Standards never intended to discredit Aquella

On December 29, 1945, an unsigned letter came from the office of the United States Bureau of Standards written to Forbes Magazine and the Reader's Digest, protesting the publication of Mr. Steel's article.

After the Director of the Bureau was informed this letter was being reproduced and circulated by the hundreds of thousands for the purpose of disparaging Aquella, the Bureau refused to permit further public distribution of copies.

What the Bureau then did was to write *other letters* stating that the communication of December 29, 1945 was not intended to discredit Aquella.

Nevertheless, thousands of copies of that early letter still continued to be circulated through "mysterious sources."

The complete details and documentary evidence are to be found in our brochure "The Truth About Aquella."

AQUELLA...

The Controversy over "Waterproofing" before the Federal Trade Commission

For sometime back there has been a controversy between the Federal Trade Commission and the waterproofing-industry-at-large concerning the use of the word "waterproof" in advertising. What it boils down to is a definition of the word "waterproof" and not any misstatement of fact. Members of the Commission have their definition; those in the waterproofing industry have theirs. The maker of Aquella was only one of many firms that were cited on the issue.

This issue was raised almost a year ago and a complete answer was promptly filed. No further action was taken.

In the meantime, however, there emanated from the same "mysterious sources," thousands of notices of the Commission's citation—with the dateline conspicuously omitted.

The complete details and documentary evidence are to be found in our brochure "The Truth About Aquella."

Now about AQUELLA itself!

From the time it proved itself on the French Maginot Line, Aquella has demonstrated its effectiveness against moisture and seepage in thousands of instances, in various types of masonry construction. There is no single instance where Aquella has ever failed *when properly applied!*

Further, we are continuing permeability tests under hydrostatic pressures which far exceed any that were ever used on Aquella by the Bureau of Standards.

Complete Documentary Evidence for you!

We have prepared a fully documented brochure which contains the complete story of Aquella.

If you are in the waterproofing industry...if you sell waterproofing...if you are counseling customers or clients on waterproofing...or if you are a buyer of waterproofing materials, you owe it to yourself to know the truth!

A copy of this brochure is yours for the asking. Simply write us on your letterhead.

PRIMA PRODUCTS, INC.
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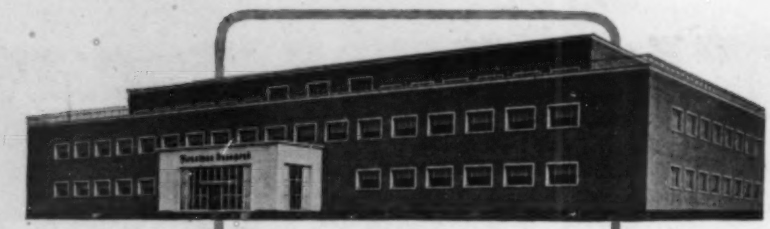


The ADD-A-PIPE, ADD-A-WIRE BUILDING

Firestone Research Laboratory
Akron, Ohio

Voorhees, Walker, Foley & Smith
Architects and Engineers

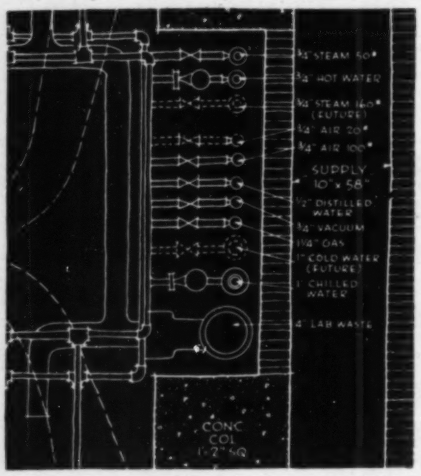
The scientist must have what he needs — where and when he needs it. The utility of his laboratory is measured in terms of quick flexibility.

That is why the Firestone Laboratory has service lines for distilled water; hot water; chilled water; electricity, both AC and DC, in several different voltages including some three-phase AC; gas; vacuum; air at 20 lbs. and 100 lbs.; steam at 50 lbs. and 160 lbs.; and the necessary drains — all available at virtually any spot and with provision for adding a pipe or a wire wherever it may later be needed. Even the prefabricated partitions and the fluorescent lighting are movable! And — the whole structure is actually a building within a building; a day-lighted office building serves as the enclosure for the windowless, air-conditioned laboratory building.

◆

Utility is one of the three major yardsticks by which the architect measures every building project — and every building product. By Utility he means both usefulness — how the structure serves its purpose — and length of usefulness. (Appearance and Investment Value are his other yardsticks*.)

The Utility-minded readers of Architectural Record are the active architects and engineers who prepare plans and specifications for over 80% of all investment building. They received the story of the Firestone Laboratory pointed up with 47 photographs, floor plans and detail drawings — plus a Time-Saver Standards section on service piping detail.



◆

The Record selected this project for editorial presentation—and was selected by Voorhees, Walker, Foley & Smith to present it — because the Record's editors (architects and engineers themselves) have a way of knowing at all times just what their readers are doing, what information they need and how they want it. (Record editors are the only editors who have Dodge facilities** for finding out these things.)

Architectural Record is the intensely practical work book of the intensely practical architect-engineer who specifies building products. This is the market-place in which to *keep your story told.*

**We have prepared a check list — "Pointers on writing architectural copy" — which enlarges on the three yardsticks of Appearance, Utility and Investment Value. Your copy will be mailed on request.*

***Dodge reporters — 750 of them — maintain regular contact with 138,000 sources of authoritative building planning news — through some 1,845,000 personal calls and 1,383,000 telephone calls per year.*

ARCHITECTURAL RECORD

119 WEST 40TH STREET, NEW YORK 18

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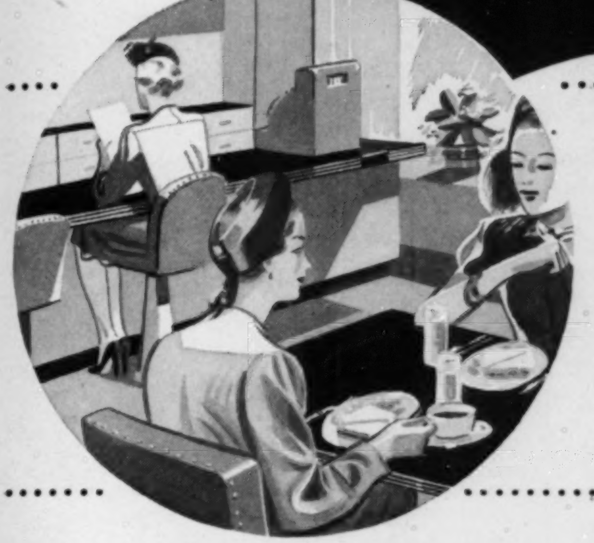
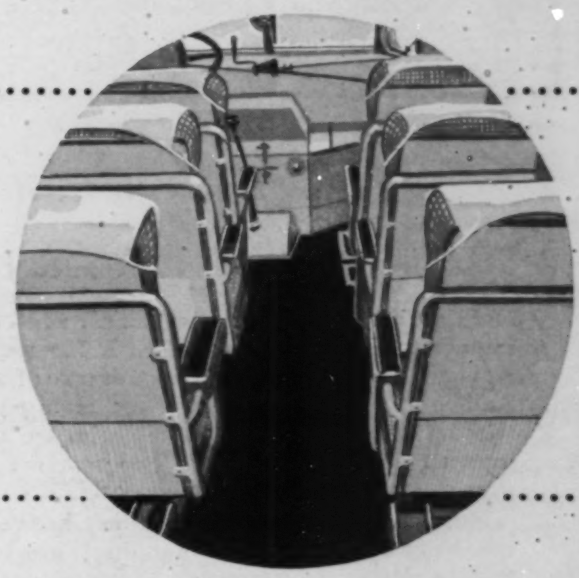
How Kimpreg* gives plywood the character of plastic



IMPROVES BEAUTY—Now plywood gets a beauty treatment that's *functional*, too. Kimpreg*, fused to plywood, creates a beautiful plastic finish. Kimpreg can retain or cover natural grain, has fused-in color but may be painted like wood. It will not stain or fade and is easily washable.



INCREASES DURABILITY—Kimpreg plastic armor multiplies the service years of plywood. It defies weather, water, fungus, termites and rot. And it increases abrasion resistance. A bus floor of Kimpreg showed little sign of wear after 76,000 foot passages over it.

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the new plastic armor for plywood

NEW KIMPREG OPPORTUNITY BOOK—See what new and profitable possibilities Kimpreg offers in *your* business. Get the colorful, illustrated new Kimpreg book . . . full of information, specifications, and application ideas for plywood and Kimpreg. Mail the coupon for your free copy today.

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AR646

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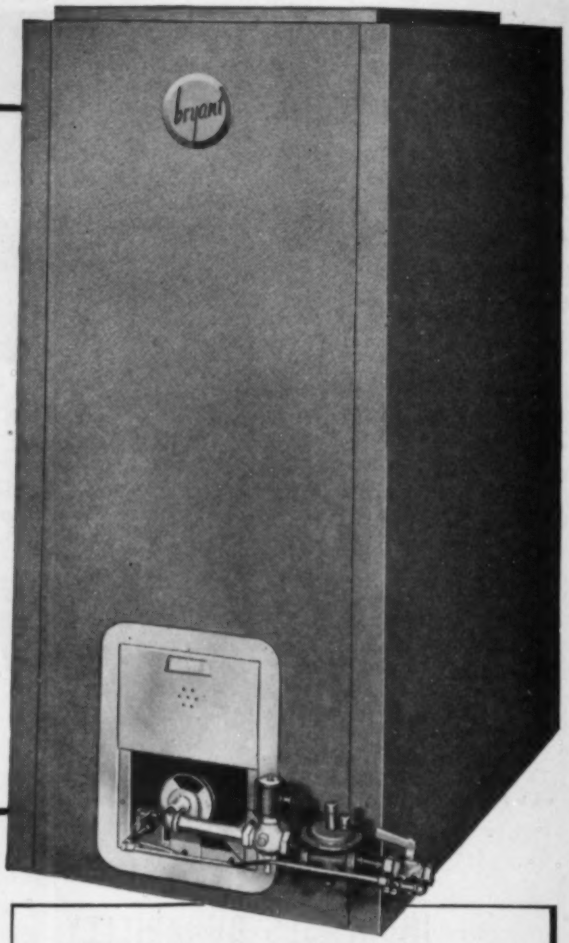
RESEARCH

*TRADE MARK

Here's the Furnace for

THOSE G. I. HOMES



NEW STEEL GRAVITY WARM-AIR FURNACE OFFERS THESE FEATURES:

1. **Drum-tube Heat Exchanger**—flue gas travel all upward, no condensation pockets, quiet operation.
2. **Inner Radiation Shield**—completely surrounds heating element to insure low casing temperature.
3. **Axial Burner**—cast iron with raised drilled ports; easily accessible, adjusted or removed.
4. **Easy-Reach Controls**—handily located for inspection and adjustment.
5. **Compact Draft Hood**—easily removed to provide access to heat exchanger tubes.
6. **Attractive Casing**—gray finished steel; compact, sturdy design.

THE *new* BRYANT

STEEL GRAVITY WARM-AIR FURNACE

Holding down the cost of materials and equipment is important in the building of G. I. Homes, because of rigid government limitations on this type of construction. And in order to keep within the required cost range without sacrificing quality, those who are a part of the gigantic Veterans' Housing Program are looking to new materials and new equipment.

Now coming off production lines in ever-increasing quantities is the *new* Bryant steel gravity warm-air furnace. Here is a completely automatic furnace with a reasonable price which enables it to be installed in any G. I. Home with satisfaction and economy. It has many of the features incorporated in higher-priced Bryant equipment, and is the most quiet, compact and sturdy gas-fired furnace ever offered in the popular-priced field.

And back of it is the famous Bryant name—the name which has signified quality gas heating equipment for more than thirty-five years. Ask the nearest Bryant representative to tell you the complete story on the new Bryant steel gravity warm-air furnace. You'll agree that it's *the furnace for those G. I. Homes!*

BRYANT HEATER COMPANY
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One of the Dresser Industries

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LET THE PUP BE FURNACE MAN

The most complete line of gas heating equipment in the nation!

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Rust-Resistant Throughout

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Each year, several billion dollars worth of iron and steel products are destroyed by rust. Your contribution to this staggering sum can be reduced by making sheet metal parts from Toncan Iron—the material that is rust-resistant throughout its entire cross-section.

Toncan Iron is made from highly refined open-hearth iron. With this is alloyed twice as much copper as found in copper-bearing steel. Molybdenum is added to force the copper to produce its maximum protection against rust. That's why Toncan Iron has the highest rust-resistance of any ferrous material in its price class.

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To give sheet metal products low cost rust-resistance, make them from Toncan Iron. For complete details, write for Booklet 406, "A Few Facts About Toncan Iron for Architects and Engineers."

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—or write us for detailed information on these Republic Steel Building Products:
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Fretz-Moon Rigid Steel Conduit
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REPUBLIC STEEL

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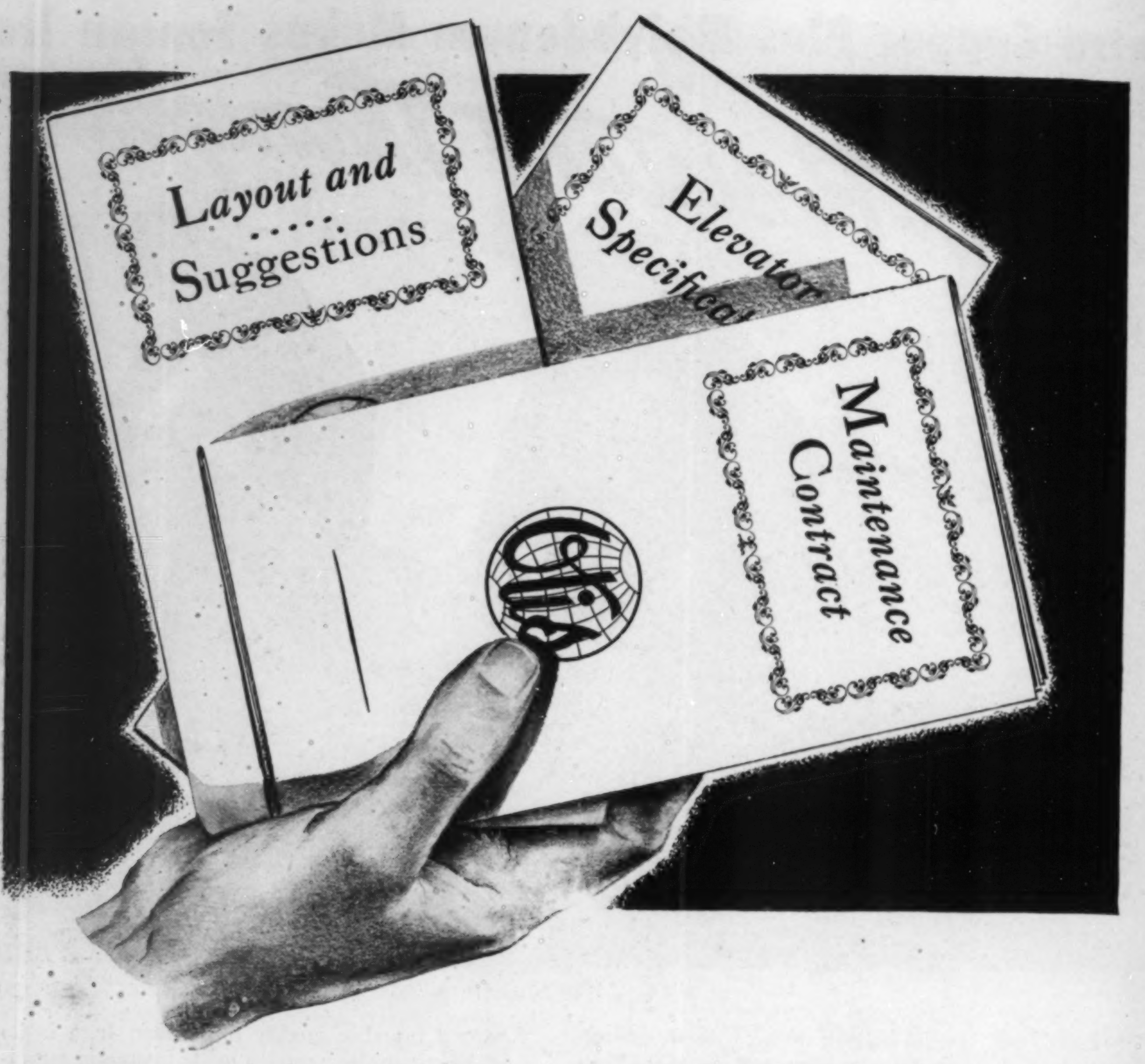
—for ducts, gutters, conductor pipes, roofing, siding, tanks, ventilators, skylights, hoods, and other sheet metal applications requiring rust-resistance—and for corrugated metal drainage products.



Freedom from Care

Early in the planning stage of a building comes an opportunity to free yourself and your client from uncertainty and time consuming details about vertical transportation.

By specifying elevators and escalators by Otis Elevator Company, this freedom from care exists before, during and after the construction period. This is because Otis provides:

1. **PLANNING:** Authoritative recommendations and layouts based on real experience. Personal analysis of your problem through our local office.

2. **MANUFACTURING FACILITIES:** All equipment (machines, motors, controls, and accessories) built by Otis for Otis . . . thus assuring minimum possibility of delays in shipment of any parts from other manufacturers. Best possible deliveries, depending on availability of raw materials.

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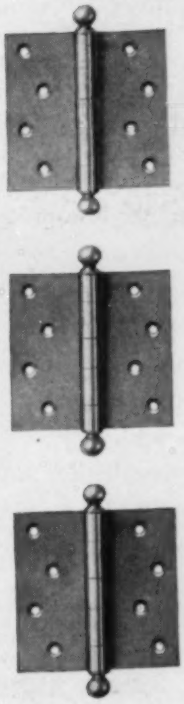
4. **CLIENT SATISFACTION:** By specifying Otis Equipment you give your client his only opportunity to contract for Otis Maintenance, which relieves *him* of all care of equipment in the future.

Otis
ELEVATOR COMPANY
OFFICES IN ALL PRINCIPAL CITIES

Good Construction

demands

THREE HINGES ON EVERY DOOR



Visible Mark of
Good Construction

REMEMBER . . .

Your prospective buyer can't see the insulation, brass piping or approved wiring you have built into a house. But there's one visible mark of good construction your prospect can see and appreciate: ***triple hinging of doors.***

You know that three hinges on a door help prevent warping – keep doors swinging free and true – and assure perfect fit of latch and lock. You also realize it may cost more to repair a single warped door than to put a third hinge on every door in the house.

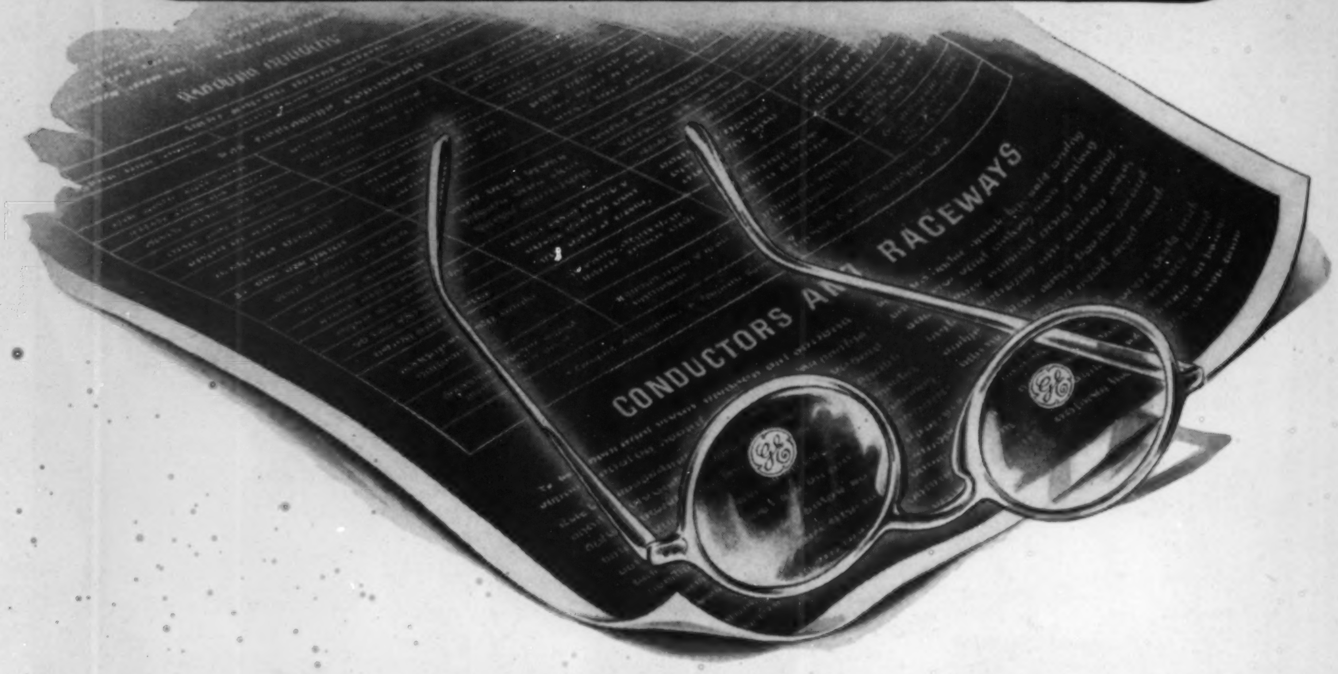
Remember–"hinge-pennies" spent for a third hinge on a door are pennies that create a visible mark of good construction – pennies that create greater customer satisfaction . . . Triple hinge your doors. It's good business! The Stanley Works, New Britain,

STANLEY

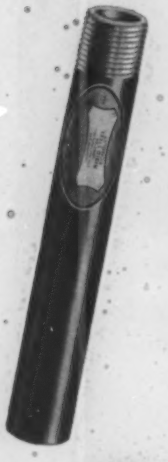
TRADE MARK

THREE HINGES TO A DOOR

PUT G-E ON YOUR "SPECS"



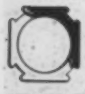
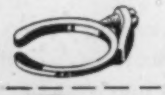
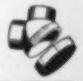
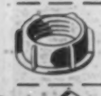
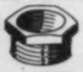
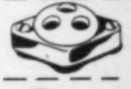
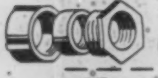
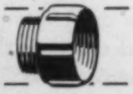
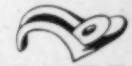
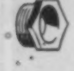
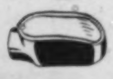
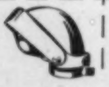
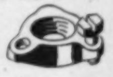
when you look for **COMPLETE** conduit protection



Say G.E. when you specify rigid conduit, and make sure that there are no weak spots in the armor of your buildings' wiring systems. Give your clients the benefits of General Electric's long experience in making top quality conduit and fittings – General Electric's reputation for products that give lasting service.

If any part of the wiring system is exposed to the corrosive action of salts, acids, or alkalies, or other chemical liquids or fumes – specify asphalt-base baked enamel-coated G-E Black conduit. For protection from atmospheric corrosion resulting from the effects of heat, cold, sunlight, moisture and weathering – specify hot-dipped, zinc-coated G-E White conduit.

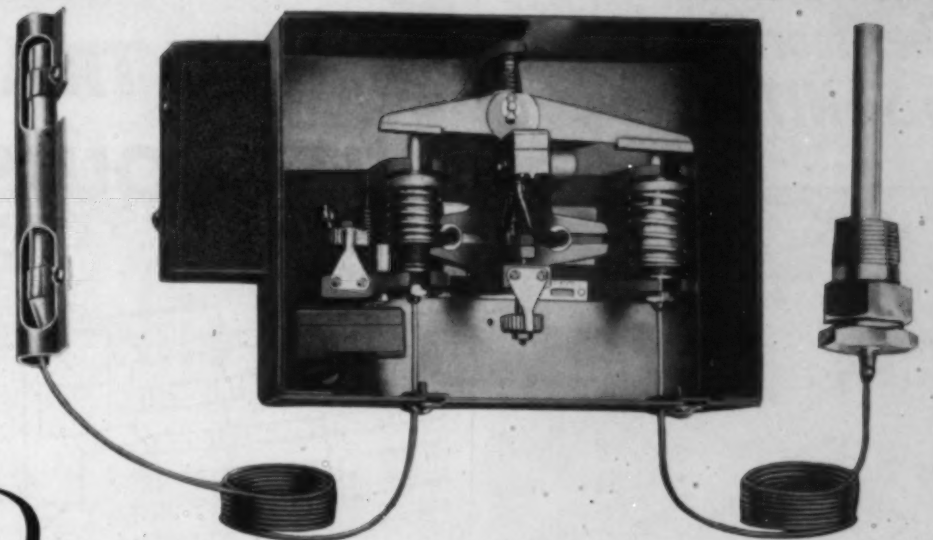
Don't stop there! Specify *G-E boxes and fittings* for use with *G-E conduit*, and be assured of easy installation and added safety. Remember: Put G.E. in your "specs," and let your customers "see" the long-lasting service they will obtain.

 **LOCKNUTS**	 **BONDING WEDGES**	**CAPPED ELBOWS** 
 **BUSHINGS**	 **REDUCERS**	**INSULETS** 
 **CONDUIT UNIONS ("Erickson Couplings")**	 **ENLARGERS**	**PIPE STRAPS** 
 **CHASE NIPPLES**	 **ENTRANCE CAPS AND ELLS** 	**BONDING BUSHINGS** 

Ask your local G-E office for information, or write to Section C663-44, General Electric Company, Appliance and Merchandise Department, Bridgeport, Conn.

GENERAL ELECTRIC

THE FIRST FULLY AUTOMATIC CONTROL



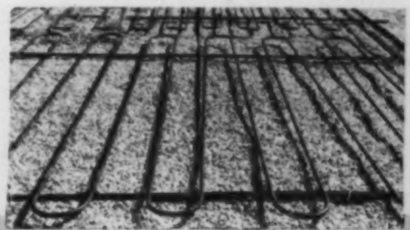
Designed ESPECIALLY FOR PANEL HEATING WITH CONTINUOUS CIRCULATION

The relatively low temperatures required by Radiant Panels using forced hot water as the heating medium *call for a control system capable of precise and continuous modulation.* In the 90 Series Controller, Hoffman designers have achieved an engineering masterpiece—a fully automatic "mechanical brain" which directs the operation of the subordinate controls. *It has proved its merit in thousands of forced hot water systems now in operation.*

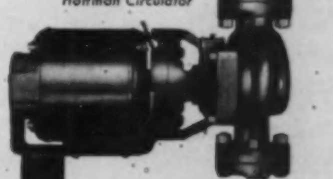
The Hoffman 90 Series Controller, activated by its Outdoor and Water Temperature Bulbs, smoothly raises or lowers the temperature of the *continuously circulating* water to meet changes in the need for heat. Thus the heat supply to the panels is always exactly equalized with the building heat loss. The diagrams below show the basic operating principles of this miracle Controller—for complete information, write for literature.

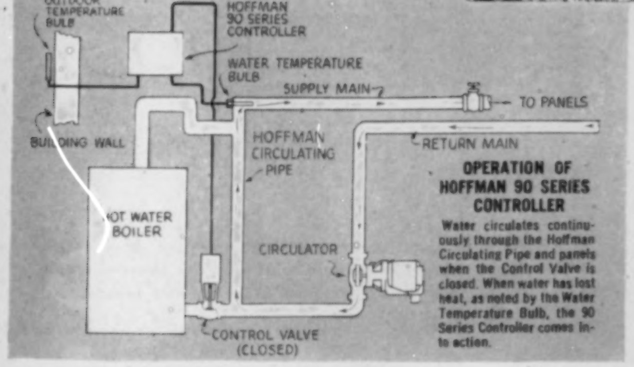
Hoffman Control Valve

Radiant panels require the smooth temperature modulation provided by the Hoffman 90 Series Controller



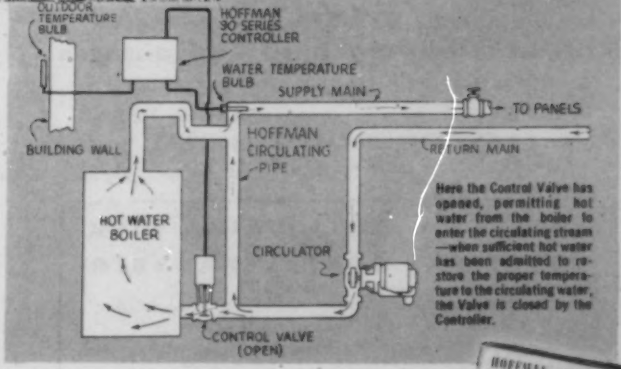
Hoffman Circulator




OUTDOOR TEMPERATURE BULB
HOFFMAN 90 SERIES CONTROLLER
WATER TEMPERATURE BULB
SUPPLY MAIN
TO PANELS
BUILDING WALL
HOFFMAN CIRCULATING PIPE
RETURN MAIN
HOT WATER BOILER
CIRCULATOR
CONTROL VALVE (CLOSED)

OPERATION OF HOFFMAN 90 SERIES CONTROLLER

Water circulates continuously through the Hoffman Circulating Pipe and panels when the Control Valve is closed. When water has lost heat, as noted by the Water Temperature Bulb, the 90 Series Controller comes into action.


OUTDOOR TEMPERATURE BULB
HOFFMAN 90 SERIES CONTROLLER
WATER TEMPERATURE BULB
SUPPLY MAIN
TO PANELS
BUILDING WALL
HOFFMAN CIRCULATING PIPE
RETURN MAIN
HOT WATER BOILER
CIRCULATOR
CONTROL VALVE (OPEN)

Here the Control Valve has opened, permitting hot water from the boiler to enter the circulating stream —when sufficient hot water has been admitted to restore the proper temperature to the circulating water, the Valve is closed by the Controller.

HOFFMAN Hot Water
CONTROLLED HEAT

HOFFMAN Hot Water CONTROLLED HEAT

Hoffman Specialty Co., Dept. AR-6, 1001 York St., Indianapolis. Famous for Hoffman Valves, Traps, Vacuum and Condensation Pumps, Forced Hot Water Heating Systems.

Specify TERRAZZO
The Floor That
is SANITARY

Clean-Colorful-Durable

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Wherever EXTRA cleanliness is a *must* — and health must be protected use TERRAZZO. Schools, Hospitals, Food stores and factories, Filtration and Water plants — all profit with the added safety and spotless sanitary cleanliness that TERRAZZO offers.

TERRAZZO is easy to keep clean. Routine washing and mopping plus polishing at occasional intervals keeps TERRAZZO in excellent shape. It is highly stain-resistant and practically mar-proof under severest wear.

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- *COMFORT*
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Get your fact-filled handy reference kit NOW— it will show you why TERRAZZO is ideal for most any type of job.

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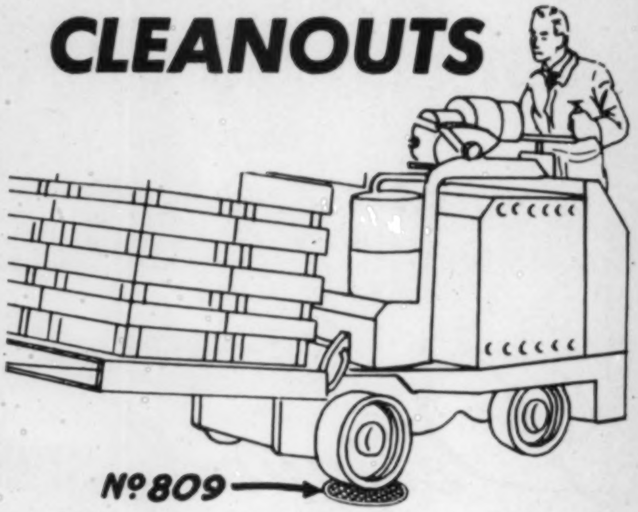
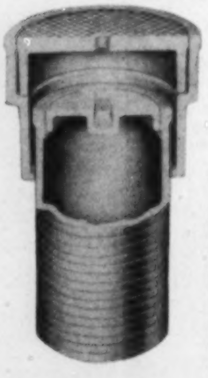
1420 New York Ave., N. W., Dept. R, Wash. 5, D. C.

Boosey No. 809 HEAVY TRAFFIC CLEANOUTS



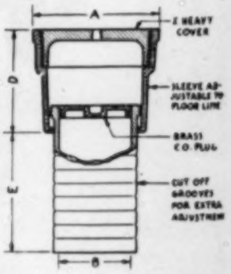
Save Installation and Maintenance Costs

Here's real protection against heavy floor traffic. Adjustable to floor level while concrete is being poured, the Boosey No. 809 eliminates many hours of installation and resetting due to errors in calculating. Heavy cover and sleeve protect countersunk brass plug and assures straight uniform level floor. Available in 2", 3", 4" and 6" diameter sizes. Inquire today. Specify Boosey No. 809.



Nº809

DIMENSIONS				
OUTLET	A	B	D	E
2"	6¼"	2"	5½"	ADJ
3"	6¼"	3"	5½"	"
4"	6¼"	4"	5½"	"
6"	8¾"	6"	5½"	"


A
HEAVY COVER
SLEEVE ADJUSTABLE TO FLOOR LINE
BRASS C.O. PLUG
CUT OFF GROOVES FOR EXTRA ADJUSTMENT
D
E
B

Manufacturers of complete Boosey line of Floor, Shower, Urinal and Roof Drains—Grease Interceptors, Backwater Valves, Vacuum Breakers and Fixed Air Gaps. Send for complete literature.

NORMAN BOOSEY
Manufacturing Co.
DIVISION OF

General Sales Offices:
420 North La Salle St.
Chicago 10, Illinois

AMERICAN SKEIN and FOUNDRY COMPANY
FACTORY: RACINE, WISCONSIN ESTABLISHED 1900

One thing you can be sure of about this house

You don't have to be a detective to tell that a house in which floor and baseboards could separate like this wasn't built with steel joists.

Open baseboards, caused by shrinkage and settling of the floor joists, are unsightly and unsanitary. And when, as often happens, they're accompanied by plaster cracks and ill-fitting doors, there's a real headache for the owner.

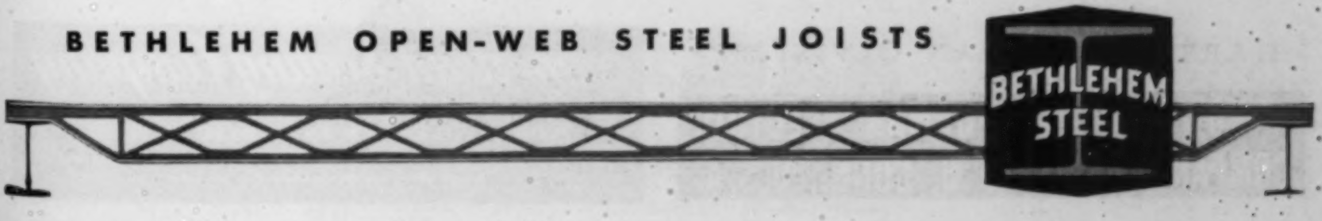
You don't have to worry about these troubles in a house built with Bethlehem Open-Web Joists, because they never sag nor shrink. And if used in economical fire-safe construction, with concrete floor-slab and plaster ceiling, they are immune to termite attack and go a long way toward discouraging rats and mice—a major problem in city apartments, stores and other light-occupancy buildings.

Bethlehem Open-Web Joists are easy to install, arrive ready to erect without falsework. They'll be in good supply throughout the reconversion period, while some other materials may remain tight and of inferior quality.

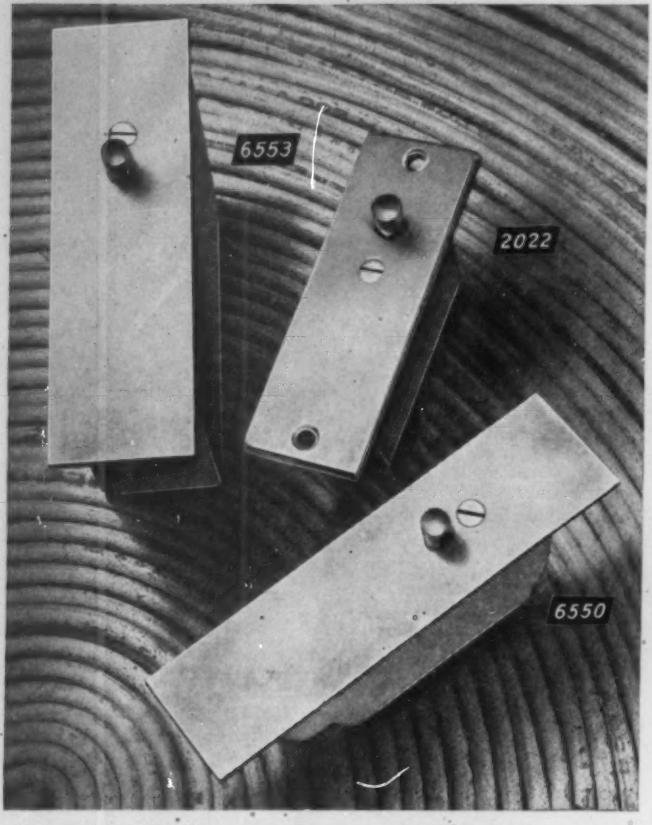
Think about Bethlehem Open-Web Joists for light-occupancy commercial and institutional buildings, as well as for residential buildings. You may even discover that, at today's price levels in your locality they'll prove suitable for small homes, at little or no extra cost—and with advantages that will be readily apparent to the home owner. For full information, write to the nearest Bethlehem district office, or to Bethlehem Steel Company, Bethlehem Pa.

SEE OUR CATALOG IN SWEET'S FILE

BETHLEHEM OPEN-WEB STEEL JOISTS



H&H AUTO-MATIC DOOR SWITCHES



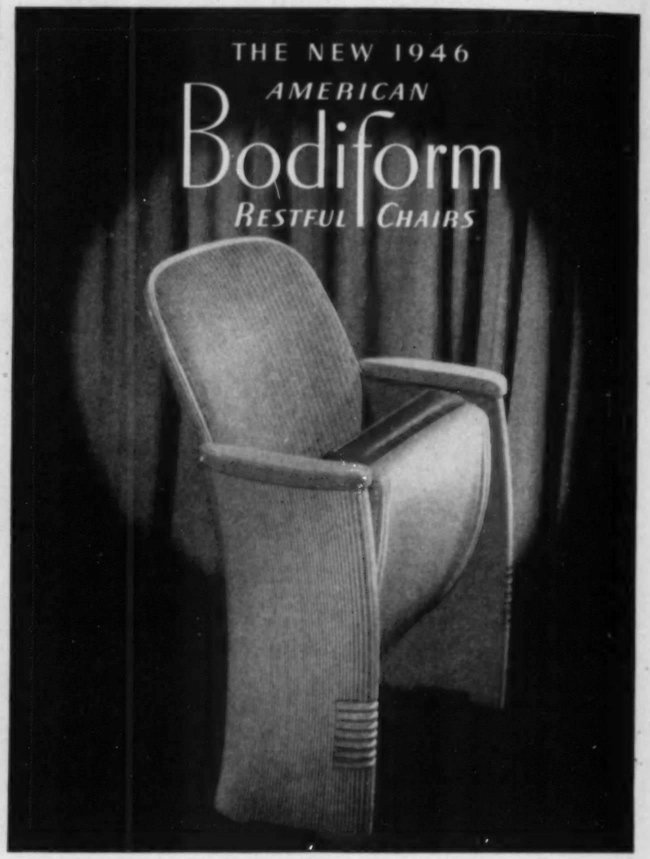
Automatically control the lights by opening and closing of doors as in closets, storage and refrigeration chambers, vaults etc. Numbers illustrated here are designed to switch on lights when door is opened; others available for lighting when door is closed. No. 6553 comes complete in an approved box with 23/32″ and 1/2″ knockouts and clamp for flexible metallic conduit. No. 2022 is mounted in a steel box, porcelain lined. No. 6550 is mounted in a porcelain base; fits all standard door switch boxes. Ratings: 6 Amps., 125 V.; 3 Amps., 250 V. Striker plates furnished with each switch.

Write for specification-
data on the *complete* line.

HART & HEGEMAN DIVISION

ARROW-HART & HEGEMAN ELECTRIC COMPANY, HARTFORD 6, CONN., U.S.A.

Specify the world's finest THEATRE CHAIRS



American Bodiform Theatre Chair with No. 12-123 End Standard

AMERICAN Seating Company's new Bodiform Theatre Chair introduces many improved features that are highly advantageous for architects engaged in building or remodeling theatres. New streamlined beauty of design, combined with new comfort and hazard-proof construction, provisions for easier, more economical housekeeping and smooth, silent operation, make them the finest theatre chairs ever developed. Bodiform Chairs are tested under conditions much more severe than those of actual use, in the world's largest and best-equipped seating laboratory.

CONSULT OUR SPECIALIZED SEATING ENGINEERS
Available at any time, without obligation, our specialized engineering service will provide whatever assistance you may need in developing your plans according to the latest achievements in clear-vision seating and chair-spacing economies. Write for full information.

American Seating Company
GRAND RAPIDS 2, MICHIGAN
WORLD'S LEADER IN PUBLIC SEATING
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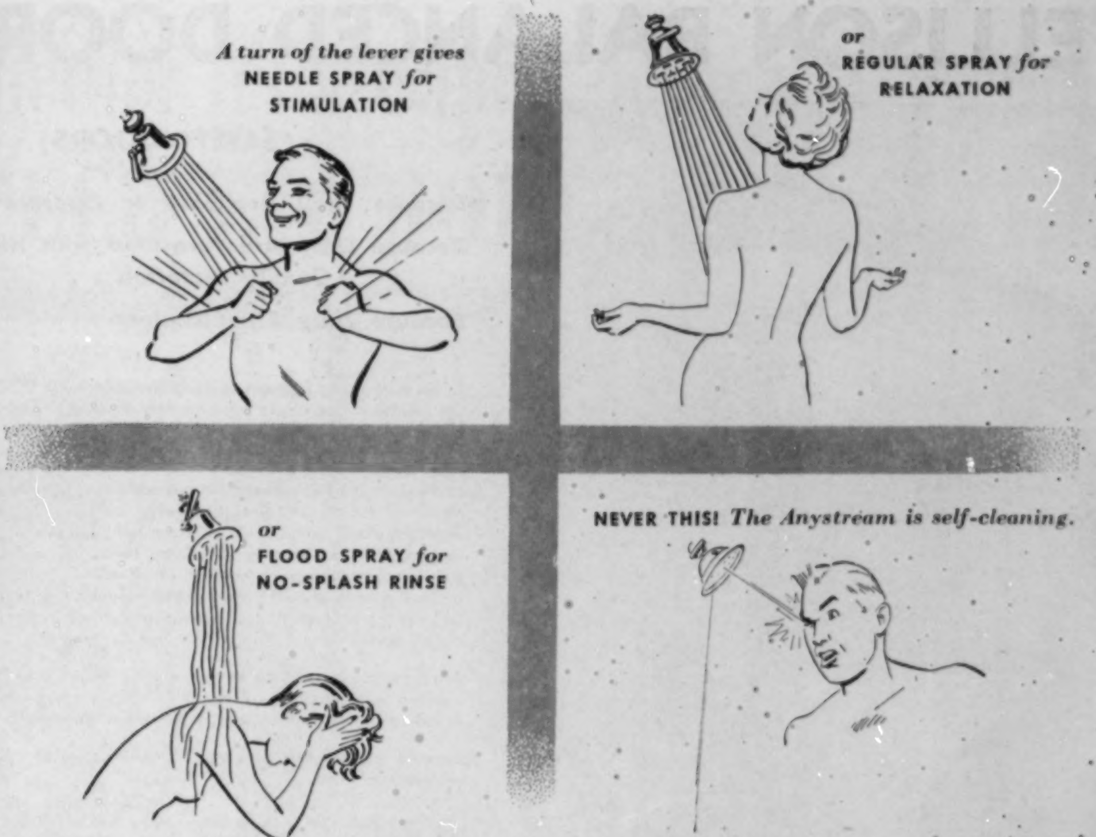

A turn of the lever gives **NEEDLE SPRAY** *for* **STIMULATION**

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NEVER THIS! *The Anystream is self-cleaning.*

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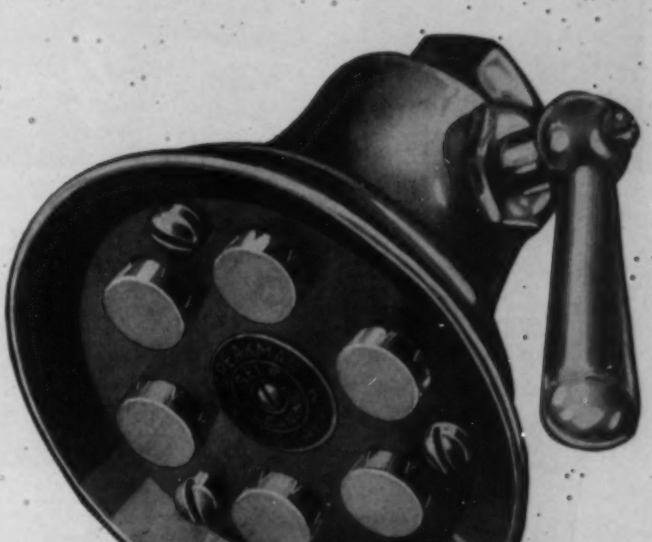

- No other shower head provides the many features of the Speakman Anystream.
- The Anystream is really three showers in one, the type of spray being adjustable instantly by the user, as shown in the sketches above.
- The Anystream is self-cleaning. In the flood position, the Anystream passes off pipe-scale, rust and sediment which clog ordinary shower heads.
- The Anystream delivers 48 individual jets of water all of which adjust simultaneously with a turn of the lever.
- The Anystream is easy to install and is designed to harmonize with all modern bathrooms.
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- And when the plungers are extended (in open position) after use, the shower head is immediately drained, eliminating that annoying after-drip.

See Sweet's Architectural File for a condensed Speakman catalog, or write for further information.

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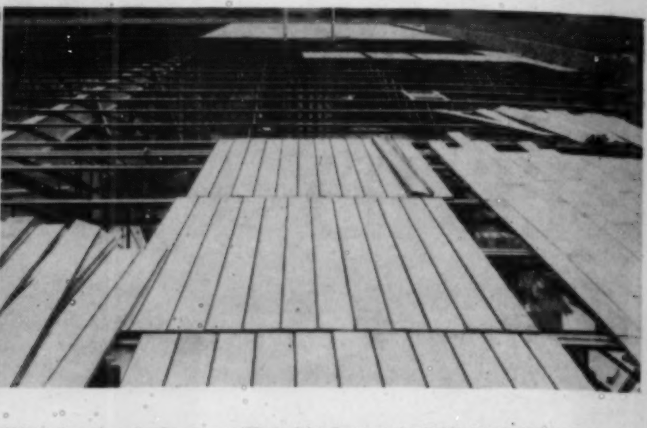

This U-shaped building, housing the Somerset (Ky.) shirt factory, is 100' x 300'. Roof supports are composed of 2 spans of 50-ft. Mesker Freespan Trusses topped by steel deck. Jack Nelson, contractor; Sam C. Malloy, architect, Louisville, Ky.

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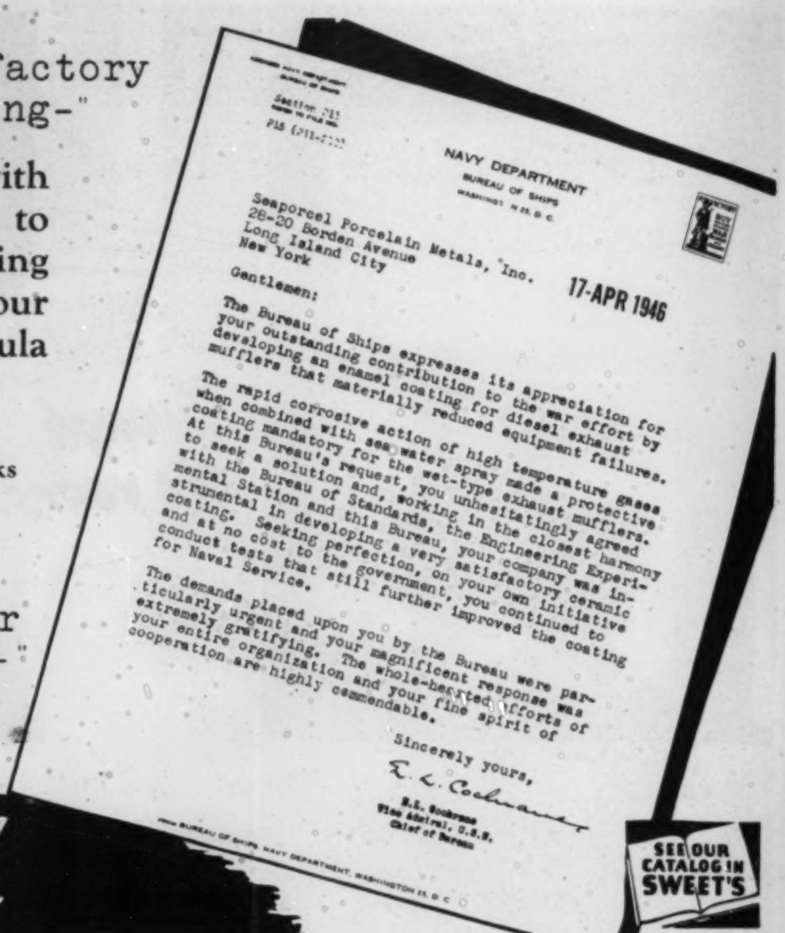

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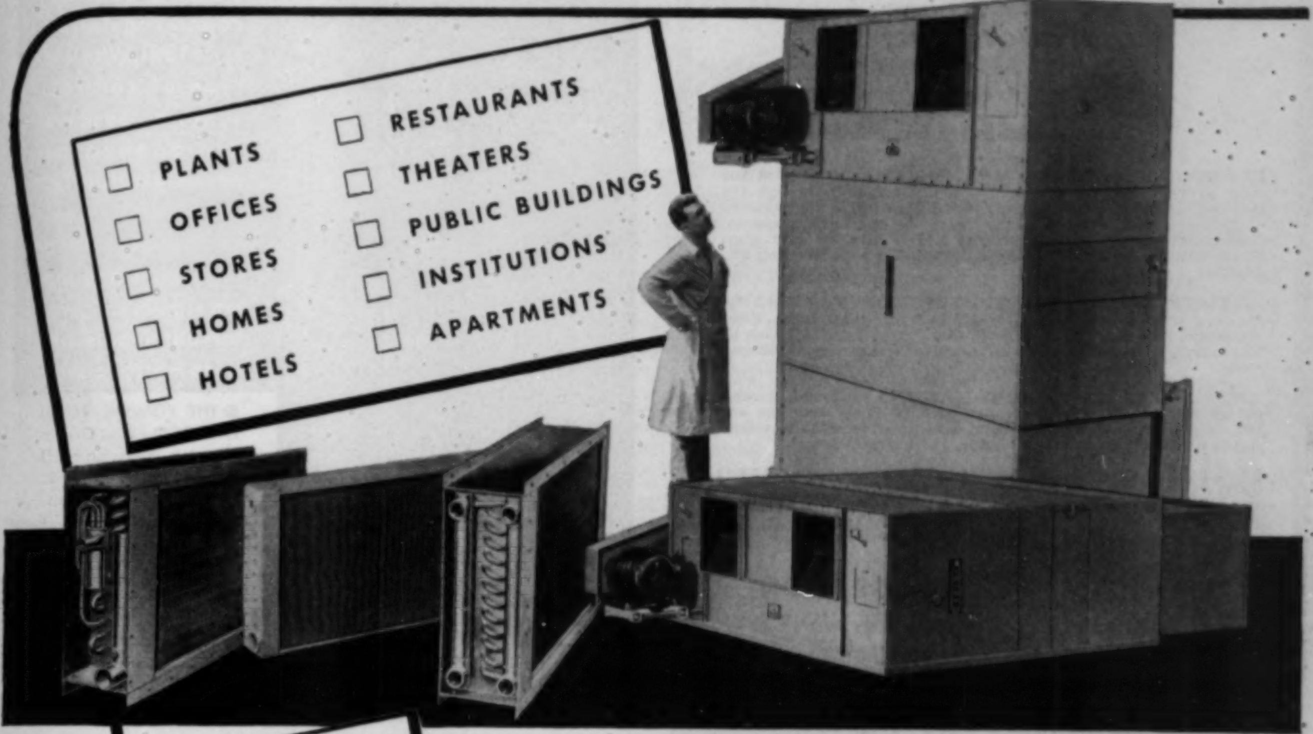

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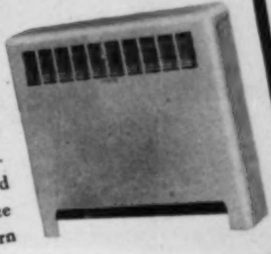

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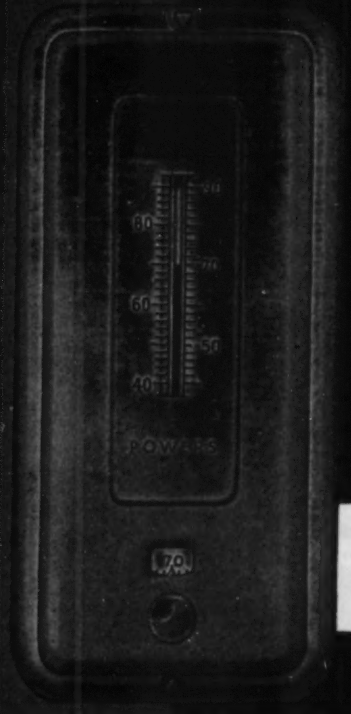

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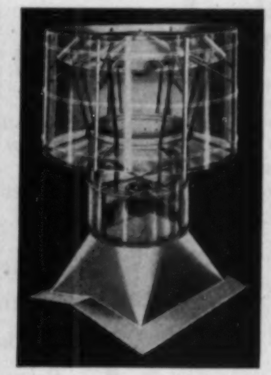

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PC Foamglas is composed of millions of tiny air cells, sealed in glass. It is impervious to moisture, vapor, the fumes of most acids. It will not burn. It repels vermin. It will not swell, or shrink, or rot, or check. It thus is totally unaffected by the elements which cause many insulating materials to deteriorate with age.

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You will want complete information on this modern insulating material. Just check the booklets offered in the convenient coupon below. Send in the coupon. Your free copies of our helpful handbooks will be forwarded immediately, without obligation. Pittsburgh Corning Corporation, Room 138, 632 Duquesne Way, Pittsburgh 22, Pa.

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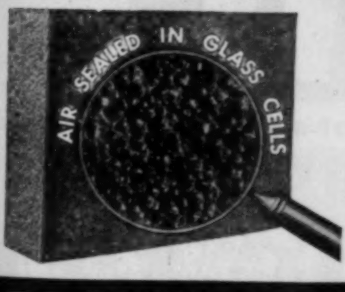
IN THE THROW ROOM of this hosiery mill, temperature, humidity and condensation must be kept under rigid control. PC Foamglas has proved helpful in solving this and other similar insulating problems.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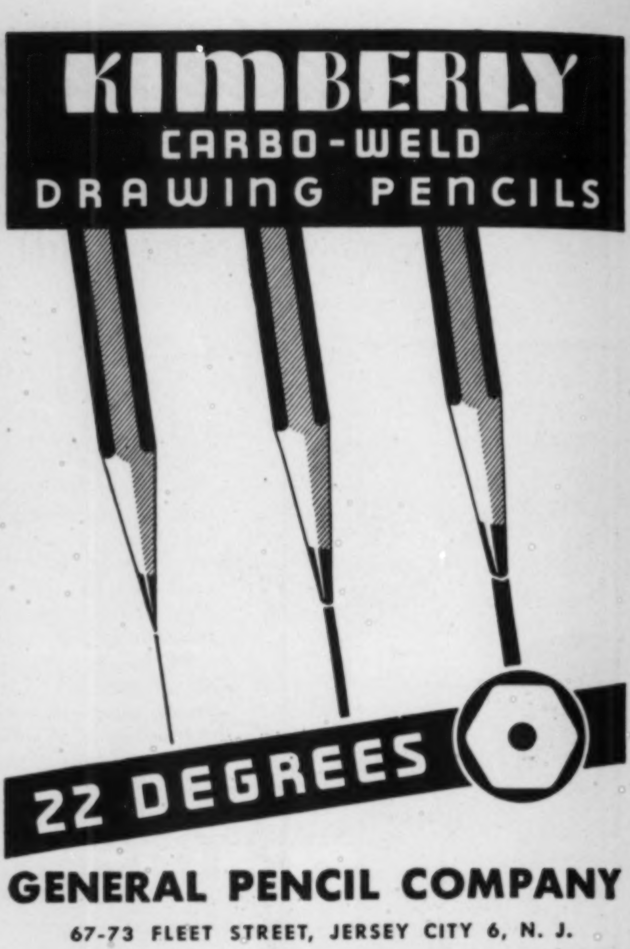

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22 DEGREES

GENERAL PENCIL COMPANY
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How much fuel, energy and equipment could you save *by saving conditioned air?*

Converting 1000 CFM of stale, odorous air to fresh air with Dorex *activated carbon* Air Recovery Equipment, instead of bringing in and conditioning outdoor air, saves:

100,000 BTU of installed heating capacity
3 tons of installed refrigeration
1800 KW hours of current per cooling season
1500 gallons of fuel oil or
9 tons of coal per heating season
Incidental water consumption and maintenance

Per 1000 CFM of heated or cooled air saved

The above savings are figured for average temperate zones. Some installations have shown greater savings, some less. But in every case, Dorex Air Recovery has *converted contaminated air to fresh air* at a cost much below that required to replace it with an equal volume of outdoor air.

We will be glad to give you the details on actual savings in typical installations or estimate the savings on any existing or planned system. For full information call the nearest District Representative or write Dept. L-11.

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HOLLENDEN
HOME OF THE FAMOUS
VOGUE ROOM
1000 ROOMS WITH BATH
RADIO IN EVERY ROOM
FIVE FINE RESTAURANTS
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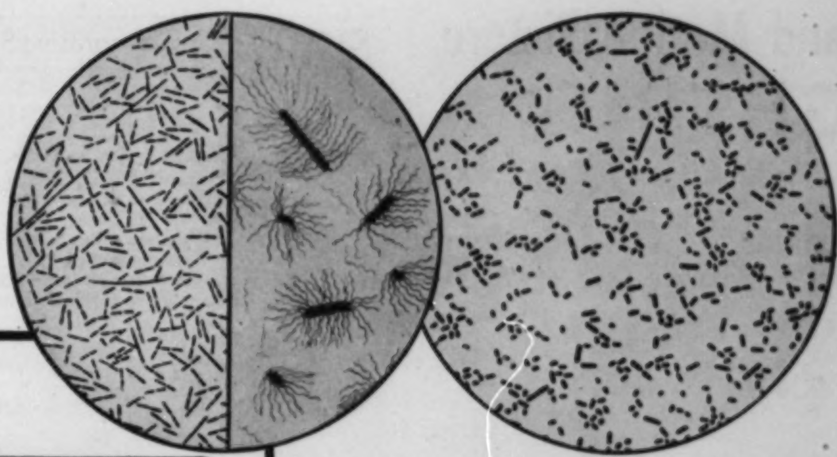

Left, 24-hour growth of B typhosus.

Right, Bacillus Typhosus, the causative organism of Typhoid Fever.

Bacillus Dysenteriae Shiga. Causes human dysentery. 24-hour culture.

STOP THIS
WITH THIS

Magnified cutaway view shows No. 50 installed in a DELANY FLUSHBOY VALVE — it can be installed on ANY make of old or new flushometer.

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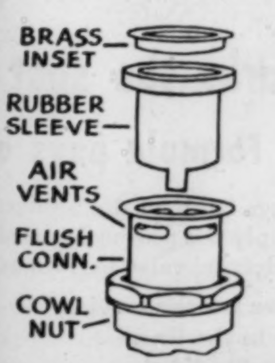
But You CAN'T MAGNIFY the DANGER from WATER-BORNE GERMS

By installing an approved Vacuum Breaker, such as the DELANY No. 50 you prevent back-syphonage from entering into the water supply line, and STOP COMPLETELY one common source of possible contamination with probably transmission of water-borne diseases such as typhoid, dysentery, possibly polio.

The No. 50 DELANY VACUUM BREAKER meets the requirements of U. S. Bureau of Standards, and is FULLY APPROVED by most States and Municipalities.

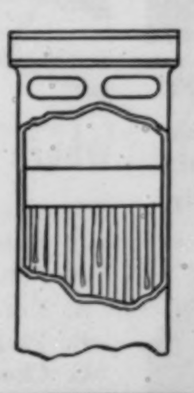
The DELANY No. 50 VACUUM BREAKER is self policing —will function for years—will prevent back-syphonage under vacuum even though maliciously or mischievously sabotaged—has only one moving part—practically invisible when installed.

EXCLUSIVE FEATURES OF THE DELANY NO. 50 VACUUM BREAKER



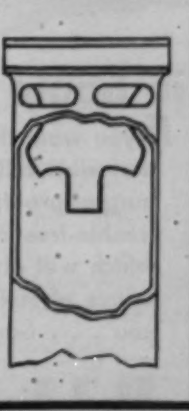
SIMPLEST ASSEMBLY —ONLY ONE MOVING PART

PRACTICALLY INVISIBLE WHEN INSTALLED



Drawings show cross section of the No. 50 in operation. The unit, upon application of flow, expands the rubber sleeve, seals off the air vents and permits the proper flushing of the fixture.

Under the weakest vacuum, the rubber sleeve of the No. 50 collapses inwardly, seals and breaks the vacuum. This instantly prevents the slightest back-syphonage.



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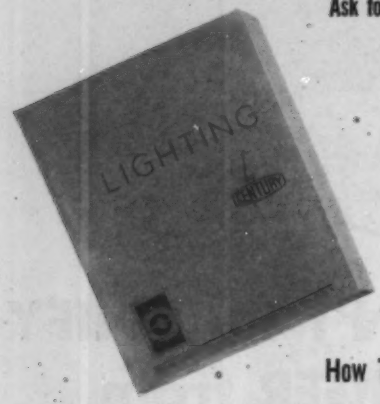

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FABRON is devised for interior walls and ceilings of buildings of all types where permanency, ease of upkeep and economy are essential requisites.

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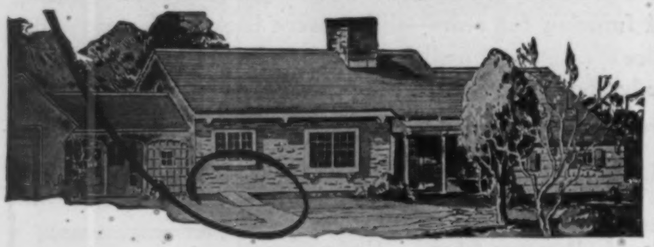

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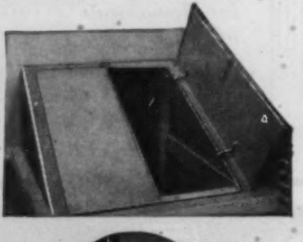

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Wherever the familiar "X" symbol indicates a valve, in any piping plan, it pays to apply this proved 3-point formula for trouble-free, time-defying valve performance.

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Architectural concrete meets every essential requirement, including firesafety, attractive appearance and economy, for apartment buildings, hotels, schools or hospitals.

This construction is economical because concrete combines both architectural and structural functions in one firesafe material.

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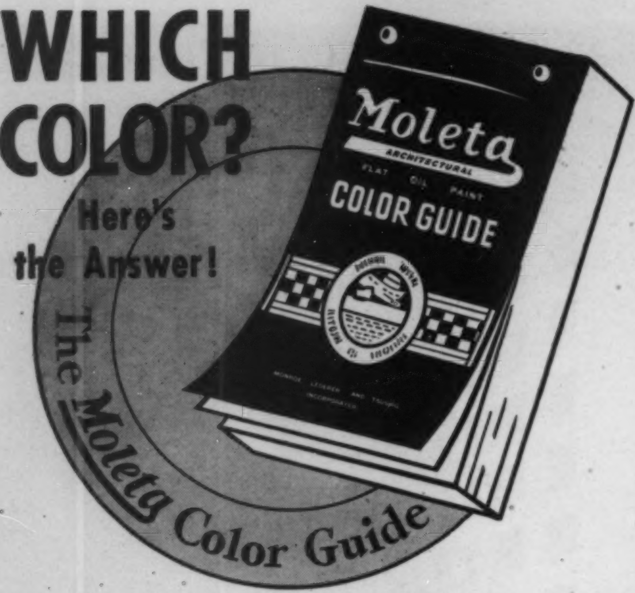

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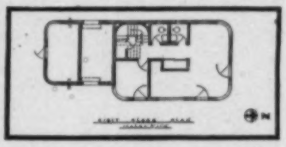

Assume that you want additional tracings of the above floor plan so that you can add the plumbing layout to one copy; the air-conditioning layout to the next, and so on.

With Ozalid, you need never redraw the "Master" original. Just make Ozalid Intermediate prints of it; add individual details in pencil or pen. Then use the "Intermediate" to produce the desired number and type of positive OZALID PRINTS.

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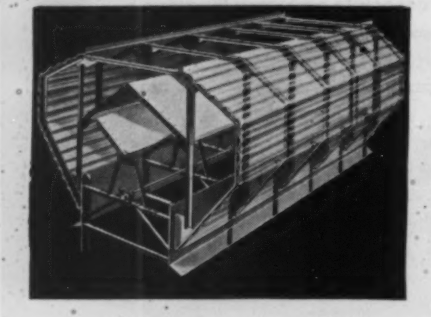

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The Burt Monovent Continuous Ridge Ventilator blends with roof lines—will look well on your clients' buildings. Its efficiency is high—as evidenced by its selection for installations like the huge Atomic Bomb project—its cost is low. See Sweet's or write direct for complete data sheets on Burt Monovent—now!

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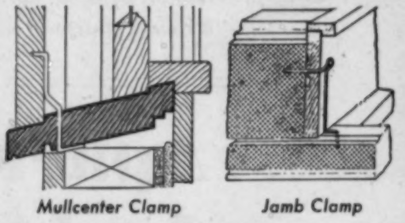

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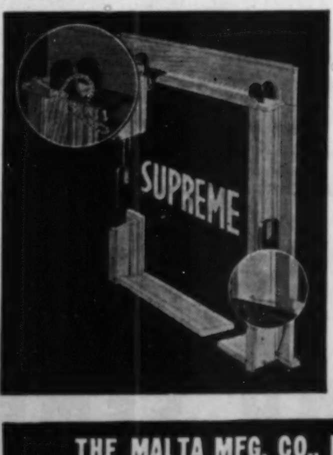
JAMB CLAMP—prevents jamb from pulling away from sill end, prevents leakage, and reinforces the frame. All important joints rot-proofed.



MULL CENTER CLAMP—assures permanent water-tight sill—Mull Center Joint.

OVERHEAD PULLEYS—permit cutting frame any length down to pockets—allow any type weather stripping—give frame neater appearance.

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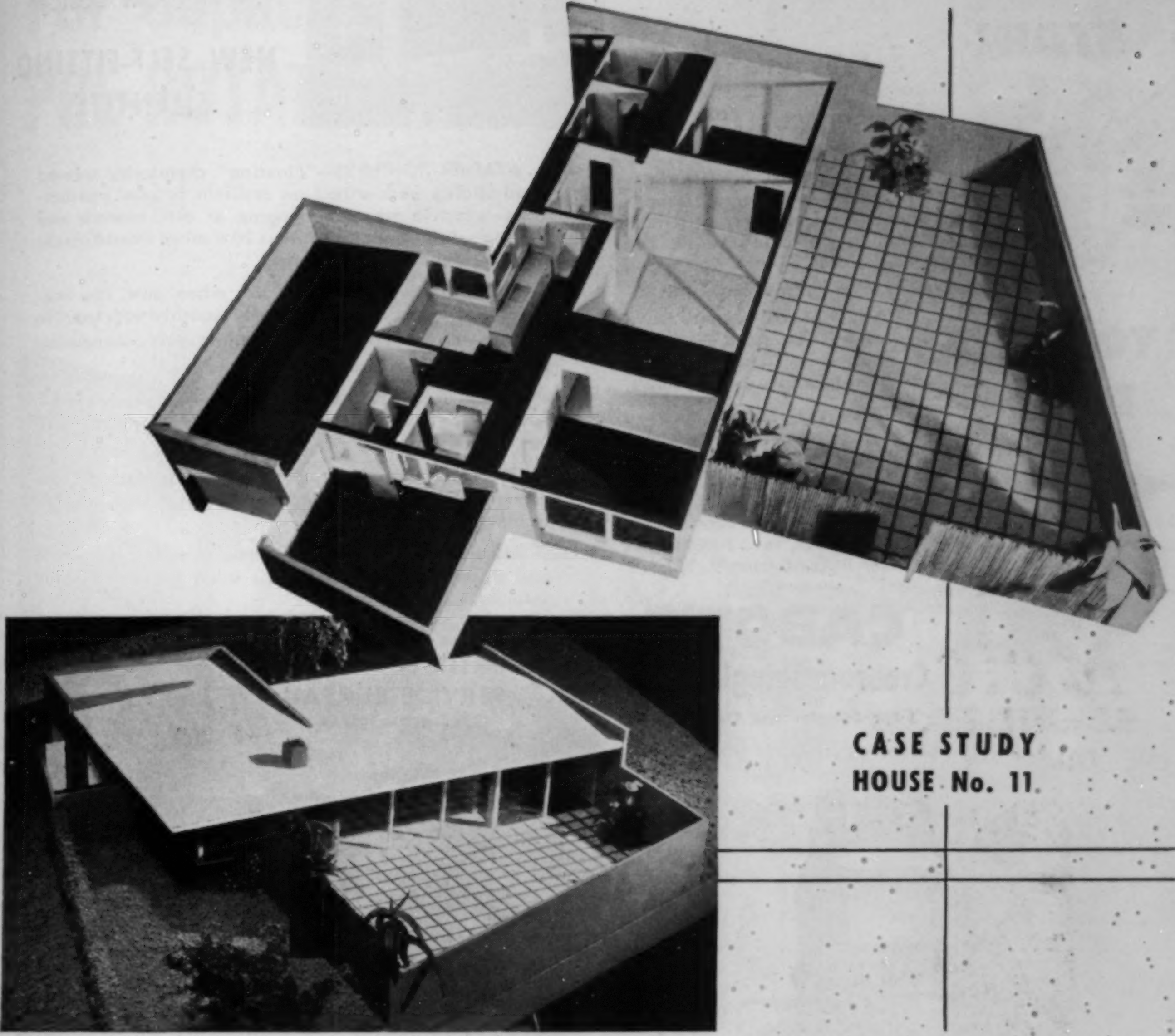

CASE STUDY
HOUSE No. 11

Just completed, Case Study House #11 was designed by J. R. Davison, Architect, as one of the continuing series of studies sponsored by Arts & Architecture in behalf of good design and good construction.

The merit specification basis on which materials for all these houses are selected has led to the extensive use of Revere building products in the program. In Case Study House #11, which imposes especially important requirements on the flashing, Revere Leadtex (lead coated copper)* was specified and used throughout.

Revere Sheet, Strip, and Parallel Edge Strip Copper offer enduring service for roofing, flashing, gutters, conductor pipes, skylights, termite proofing, and decorative applications.

On this subject architects will find Revere's 96-page booklet, "Copper and Common Sense," extremely useful and practical. Revere urges you to refer to it in all matters of sheet copper construction. If you do not have it, write on your letterhead for a free copy while there are still a few available. For any further help you may wish, call on the Revere Technical Advisory Service, Architectural. Revere building products include Copper Water Tube, Red-Brass Pipe; Herculoy and Sheet Copper for hot water heating and storage tanks; Extruded Shapes and Panel Sheets; as well as sheet materials for structural and decorative purposes. They are sold by Revere Distributors in all parts of the country.

** Due to the acute shortage of lead, the use of lead coated copper is now officially restricted to applications "where corrosion makes the use of any other material impractical."*

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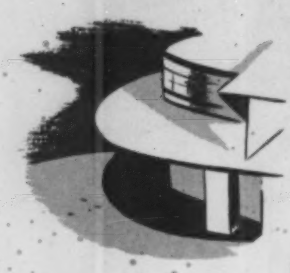
Cabot's Stains

for TODAY'S DESIGN



CABOT'S SHINGLE STAINS complete the beauty of good building design. From clear, brilliant hues to New England grays and browns, Cabot has the right stain for any building, traditional or modern. Cabot's Stains give lasting protection because they contain from 60% to 90% creosote — the best wood preservative known.

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NEW WEATHER-TIGHTNESS—"Floating" chemically treated wood sliding bars seated on resilient bronze weather-strips—effective weather-stripping at top, bottom and meeting rail. The new Silentite is 20% more weather-tight even than the original Silentite!

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this heater moves in *bag and baggage*—no building to do on the job

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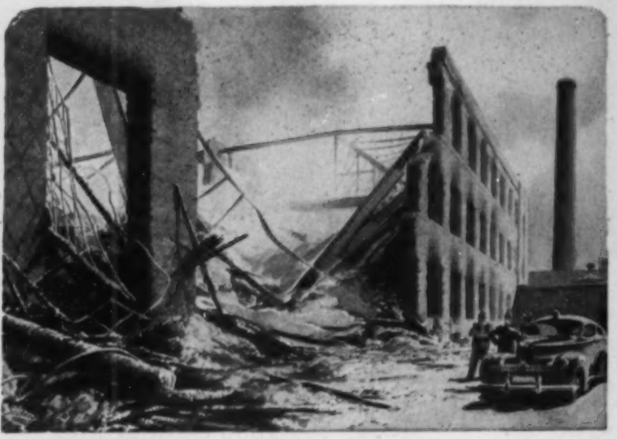
DRAVO
HEATING



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The architect, the builder and the building inspector all said this building was fireproof. And they were right! The *building didn't burn . . . it collapsed* under the intense heat from the *combustible contents.*

Modern fireproof construction *alone* can't prevent this hazard in a busy plant filled with equipment and materials. It takes automatic sprinkler fire protection, too . . . positive, ever-vigilant Grinnell Systems that *stop fire at its source.*

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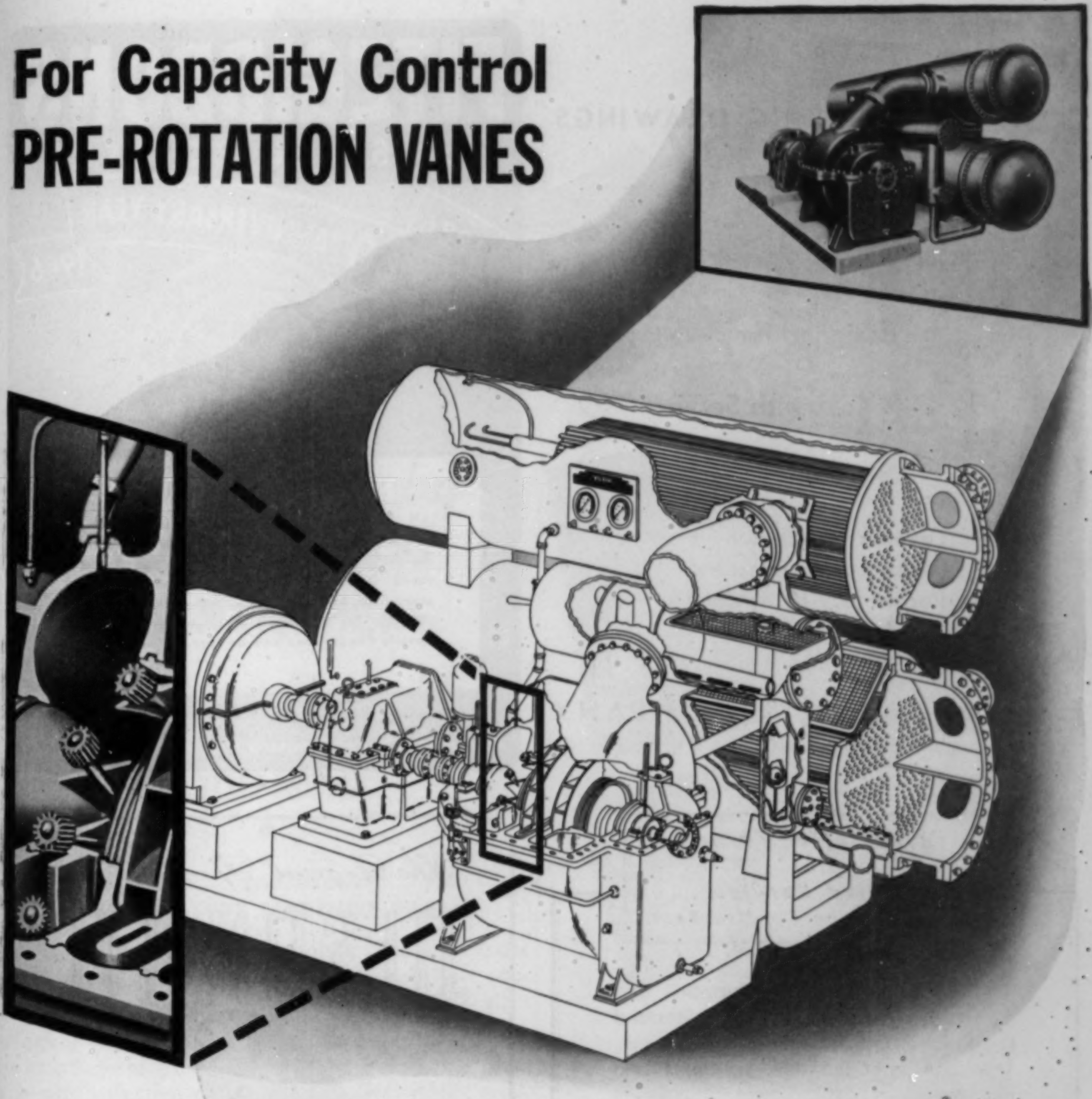
For Capacity Control
PRE-ROTATION VANES



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Capacity control to extremely low limits—approximately 10% of load—is achieved by the incorporation of Pre-Rotation Vanes in the construction of the York Allis-Chalmers Turbo Compressor. Such control is accomplished by changing the direction of the rotation of the suction gas entering the first stage wheel. Each change produces the same results as would be obtained from a separate machine of smaller size.

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THE FITZGIBBONS BOILER

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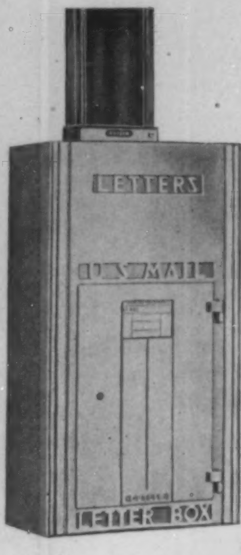

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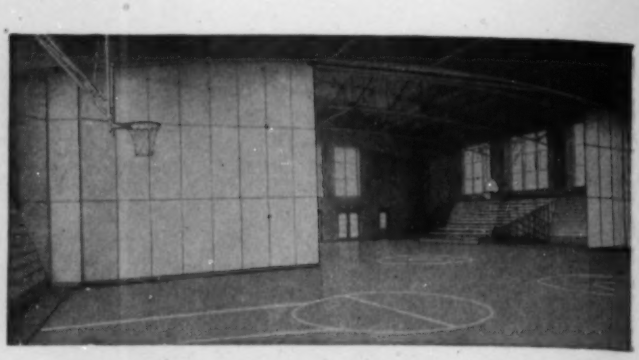

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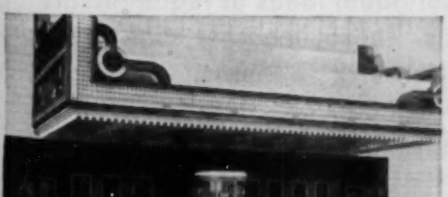

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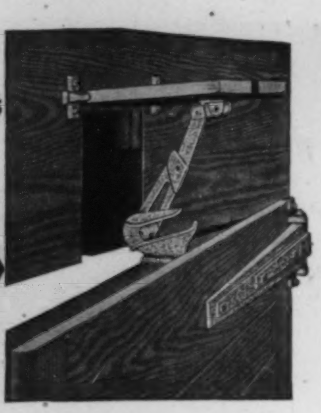

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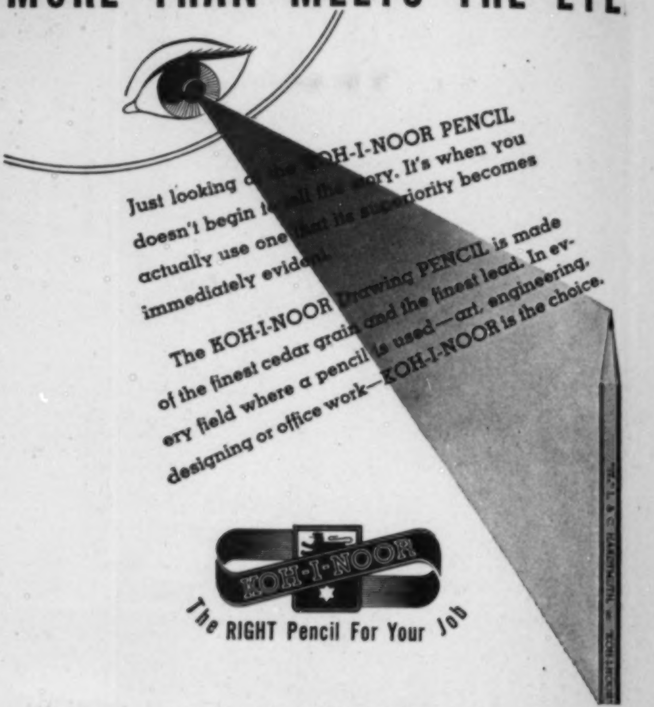

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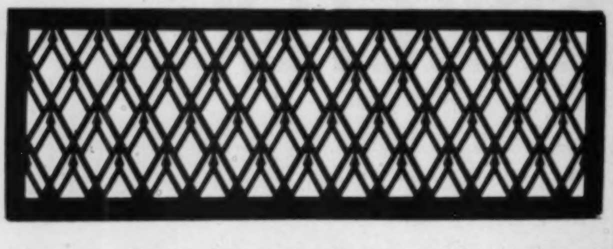

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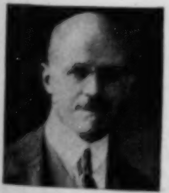
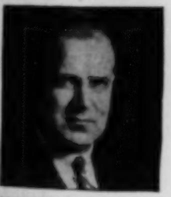


Charles Butler has been closely associated with hospital planning throughout his broad professional career. As architect or consultant, his works include St. Luke's International Medical Center, Tokyo; War Demonstration Hospital at Rockefeller Institute; Goldwater Memorial Hospital.



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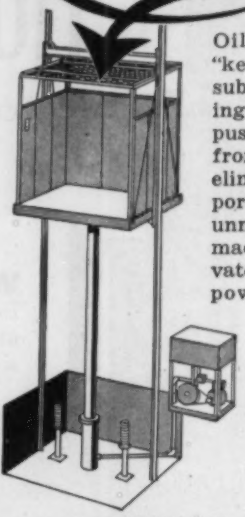

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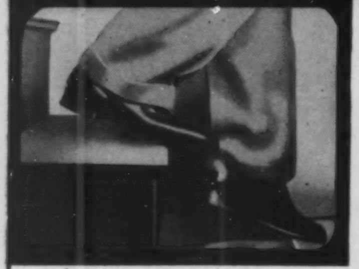

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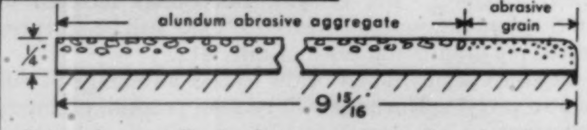

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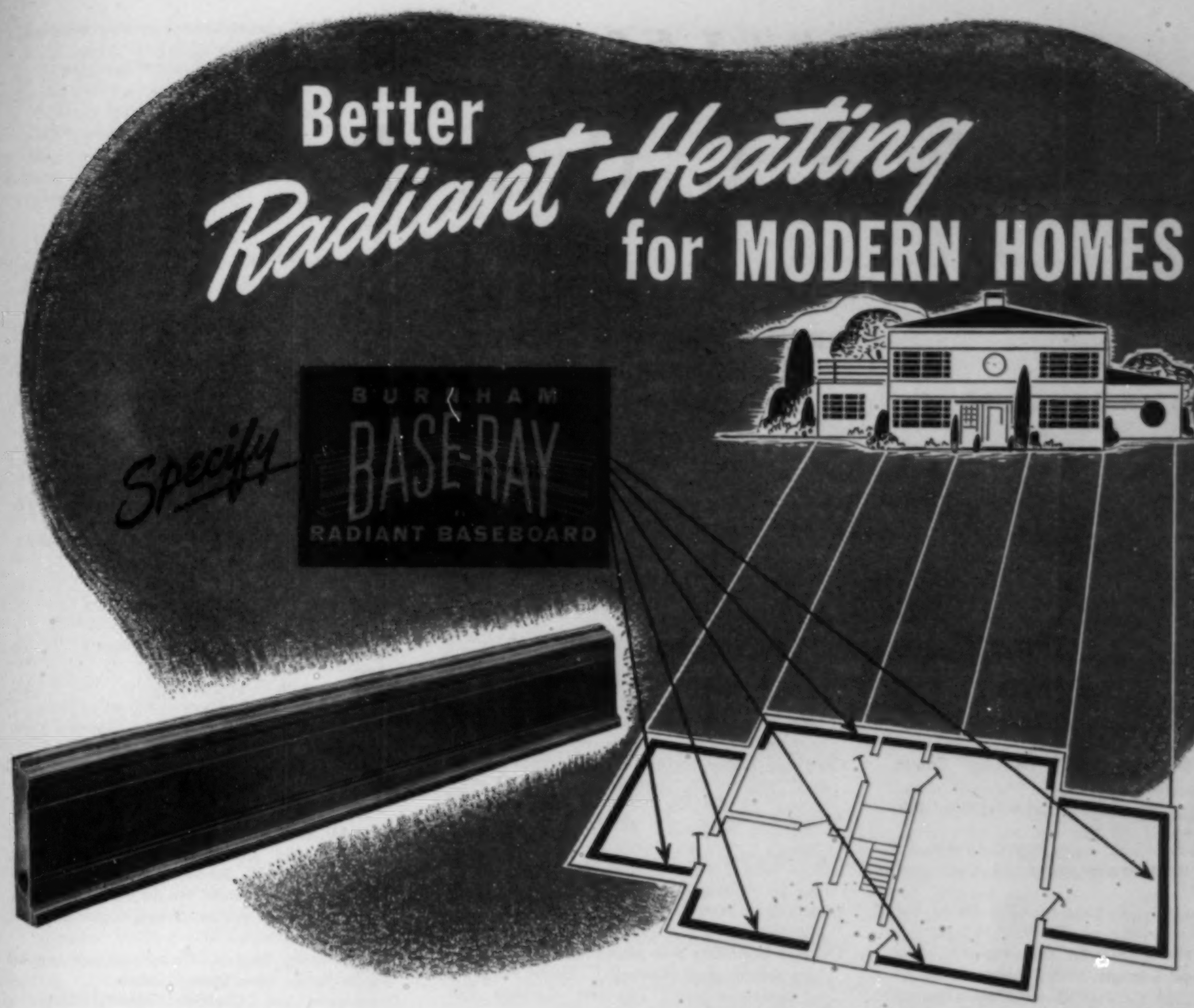

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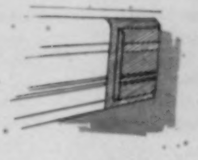

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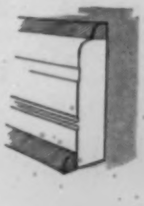

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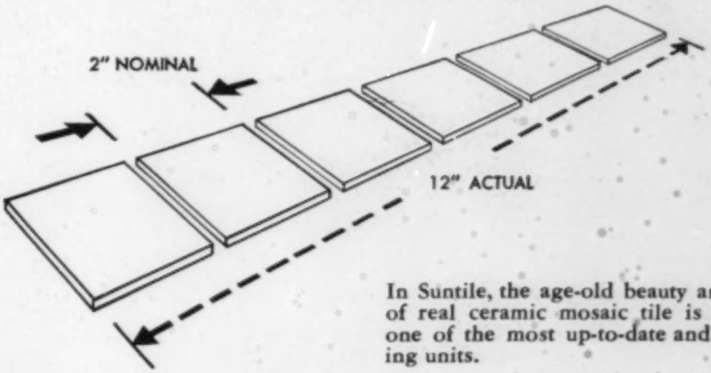

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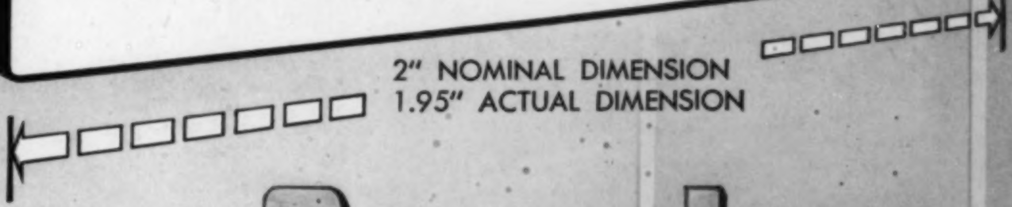

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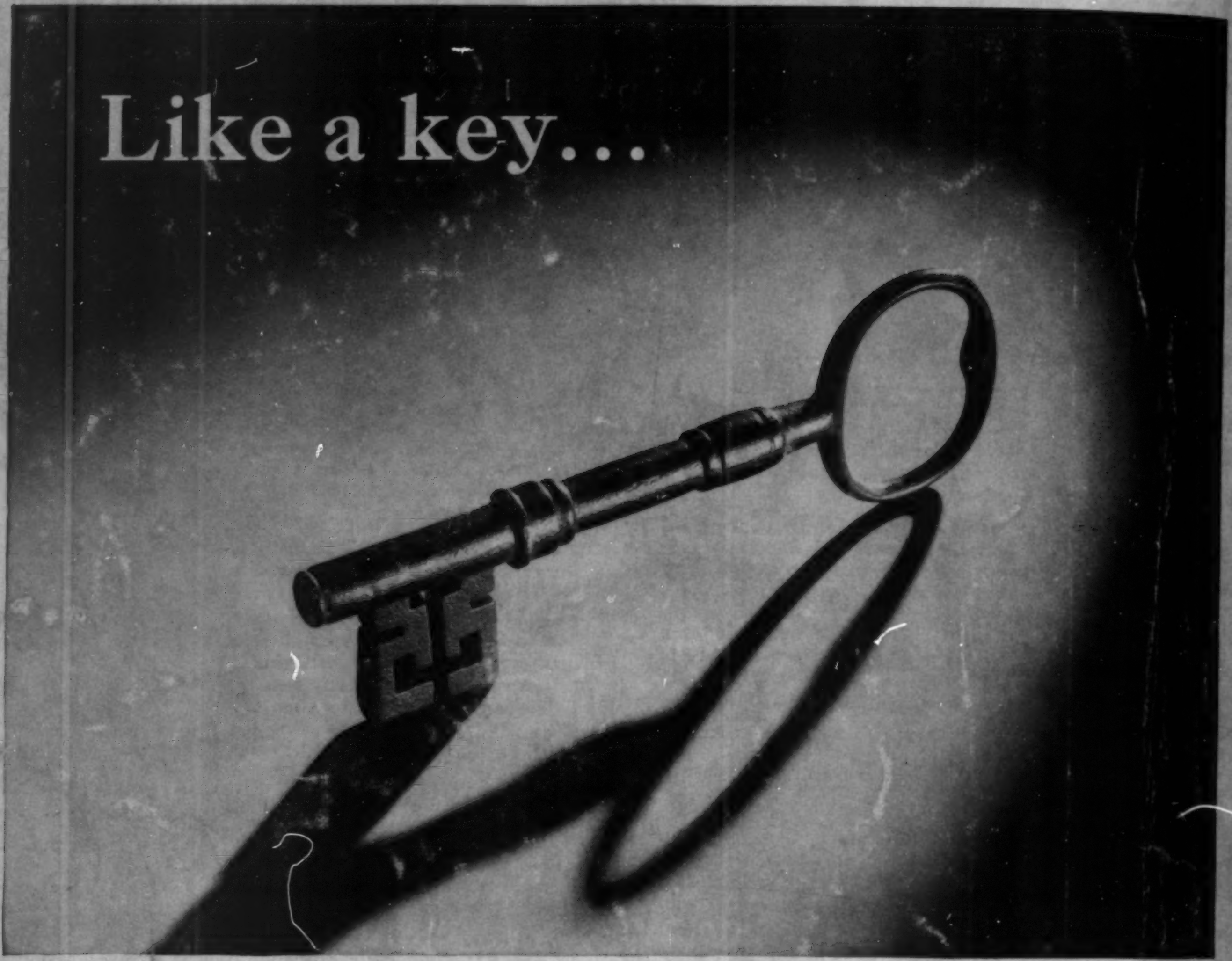

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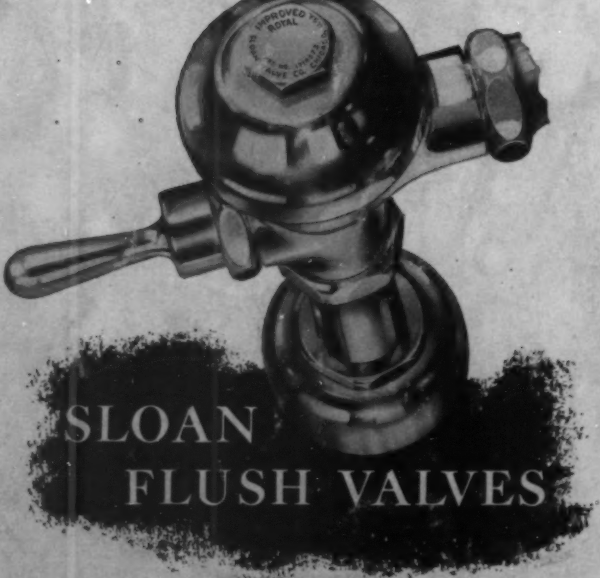

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